

A REVISION OF THE NEARCTIC SPECIES OF *DIALINEURA* RONDANI
AND *PALLICEPHALA* IRWIN AND LYNEBORG
(DIPTERA: THEREVIDAE: THEREVINAE)

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Abstract.—The Nearctic species of *Dialineura* Rondani and *Pallicephala* Irwin and Lyneborg are revised. *Psilocephala fuscipennis* Cole is **synonymized** with *Pallicephala occidentalis* (Cole). *Pallicephala quebecensis* new species, from the Great Whale River, Quebec, Canada, and *P. westcotti* new species, from Waldport, Oregon are described. A key to the species is provided along with species descriptions and distributions.

Key Words: Diptera, stilto flies, Therevidae, *Dialineura*, *Pallicephala*, Nearctic revision, species keys, descriptions, distributions

In a revisionary monograph on the Nearctic genera of Therevidae (Irwin and Lyneborg 1981a), several new genera were described and others were redescribed. This paper is the second (Webb and Irwin 1988) of a series to revise the species within the genera treated in that monograph. *Dialineura* Rondani is a Holarctic genus. *Dialineura* was erected by Rondani (1856: 155) with *Musca anilis* Linnaeus as the type species by original designation. At present, 11 species are reported from the Palaearctic region and one species from the Nearctic region. Lyneborg (1968a) and Zaitzev (1971) reviewed the genus, with subsequent new species being described by Zaitzev (1977) and Nagatomi and Lyneborg (1988). Lyneborg (1975) first recorded *Dialineura gorodkovi* Zaitzev for the Nearctic region. The genus *Pallicephala* is a Nearctic genus and was erected (Irwin and Lyneborg 1981a) for four western and one eastern species, with *P. variegata* (Loew) designated as the type species.

The morphological terminology used for the male terminalia was originally defined and described by Lyneborg (1968b) and

subsequently modified by Lyneborg (1972, 1976, 1978) and Irwin (1977a, b); that for the female terminalia was defined and described by Irwin (1976). Other morphological features are described in terminology set out in the Manual of Nearctic Diptera (McAlpine 1981). The range and ratio for each measurement is followed by the mean; the range for each setal count is followed by the mode (setal counts are taken from the left side of the specimen and, if the setal count is followed by a count in parenthesis, it indicates a difference in counts between the left and right sides of the same specimen).

Each specimen was assigned a unique THEREVIDAE/M. E. IRWIN/SPECIMEN number attached to the specimen. This number is used to associate the ecological and label data with a given specimen and is printed in italics. The data are to be incorporated into an automated data management system originally designed by Rauch (1970).

To conserve space and include as much information as possible about each specimen, a layout adopted from Irwin (1983) is

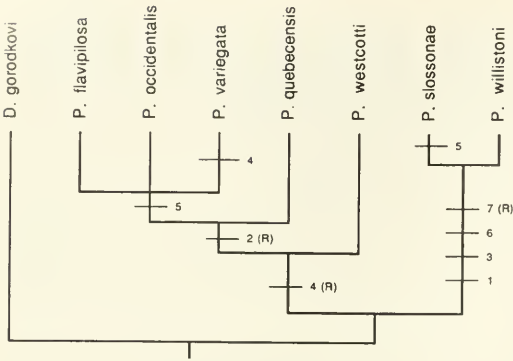


Fig. 1. Phylogenetic cladogram showing the proposed evolutionary derivations of the Nearctic species of *Dialineura* and *Pallicephala*. Numbers on the branches refer to apomorphic alternatives of characteristics listed in the text. (R) reversal to plesiomorphic state.

used in the "Specimens Examined" section of each species. Many of the terms used there are explained by Stuckenberg and Irwin (1973). The layout follows these typographical conventions:

1) Full capitals: LARGEST POLITICAL UNIT (country, or state within the United States).

2) Boldface type: **intermediate political unit** (state or province outside the United States or county within the United States) and **elevation** expressed in m above sea level.

3) Roman or normal print: smallest political unit (city or town) and modifier of that unit (distances in km, direction, and subunits of that unit).

4) Number of specimens is followed by the sex designation M for male or F for female.

5) A semicolon terminates one series of specimens and signals the beginning of the next. Data not repeated in a series are the same as those of preceding series.

Specimens have been deposited in the following museums: Academy of Natural Sciences of Philadelphia (ANSP); American Museum of Natural History (AMNH); California Academy of Sciences (CAS); Cana-

dian National Collection (CNC); Colorado State University (ColoSU); Connecticut Agricultural Experiment Station (CAES); Cornell University (CU); Field Museum of Natural History (FM); Florida State Collection of Arthropods (FSCA); Illinois Natural History Survey (INHS); Michael E. Irwin Collection (MEI); Museum of Comparative Zoology (MCZ); New York State Museum (NYSM); Oregon Department of Agriculture (OregDA); Oregon State University (OregSU); Purdue University (PU); Royal British Columbia Museum (RBCM); Royal Ontario Museum (ROM); U.S. National Museum of Natural History (USNM); University of British Columbia (UBC); University of California, Berkeley/California Insect Survey Collection (UCB/CIS); Uni-Michigan (UMich); University of Nebraska (UNeb); University of Kansas, Snow Entomological Museum (SEM); University of Wisconsin (UWisc); Utah State University (UtahSU); Washington State University (WashSU).

The phylogenetic cladogram (Fig. 1) represents the relationship we propose for the six species of *Pallicephala*. This scheme is based on characters for which plesiomorphic and apomorphic alternatives could be assumed by comparing them with specimens of the *Dialineura gorodkovi*. The cladogram was generated using PAUP (Swofford 1990) and contains the least number of convergent origins and reversals of the apomorphic alternatives.

Dialineura and *Pallicephala* may be separated from other Nearctic therevids by using the keys to the genera of Nearctic Therevidae in Irwin and Lyneborg (1981a, 1981b).

Dialineura Rondani

Dialineura Rondani (1856: 155); Irwin and Lyneborg (1981a: 204, 1981b: 519); Lyneborg (1968a); Nagatomi and Lyneborg (1988); Zaitzev (1971). Type species: *Musca anilis* Linnaeus (1761: 442) by original designation.

Derivation of name.—*diali* (word of unknown origin), *neuron* (Greek) = nerve.

Diagnosis.—The genus *Dialineura* is allied to the genera *Pallicephala* Irwin and Lyneborg and *Nebritus* Coquillett by possessing fine setae on the posterior surface of the middle coxa, by having the prosternum with fine setae in and around its central depression (exception *P. quebecensis*), and with the scape wider than the width of the first flagellomere. Both sexes of *Dialineura* can be distinguished from *Nebritus* by not having the head strongly protruding anteriorly and by having the parafacial pruinose or tomentose rather than entirely glossy. Males of *Dialineura* can be distinguished from *Pallicephala* by having the posterolateral corners of the epandrium strongly projecting and extending to or beyond the cercus and hypoproct; females of *Dialineura* are distinguished from *Pallicephala* by having setae over the entire frons.

Small- to medium-sized, moderately slender flies.

Description.—**Head:** Male eyes holoptic, facets equal; antenna (Fig. 2), length 0.5 times head depth; scape cylindrical; pedicel ovate; flagellum vase-shaped, tapered apically; style terminal, one-segmented; terminal spine minute; frons in female (Fig. 12) broad, lateral margins convergent dorsally; facial and genal calli absent; parafacial broad; clypeus concave; maxillary palp one-segmented (Fig. 3), cylindrical, apex rounded; setae scattered over entire frons, short on male, moderately long on female; elongate, abundant on gena and maxillary palp; absent on eye, parafacial, and clypeus.

Thorax: Macrosetae: np 3–6, sa 2, pa 1–2, dc 1–3, sc 1–2. Vittae brownish grey; setae moderately long; prosternal setae elongate; setae abundant on propleuron and anepisternum, scattered on katapisternum, absent on remaining pleural sclerites. **Wing** (Fig. 4): Opaque, pale whitish brown; veins brown; pterostigma indistinct; setulae absent; length of R_4 1.0–1.1 times R_5 ; cell r_4 large; length of cell r_4 2.0–2.4 times width;

Character states.

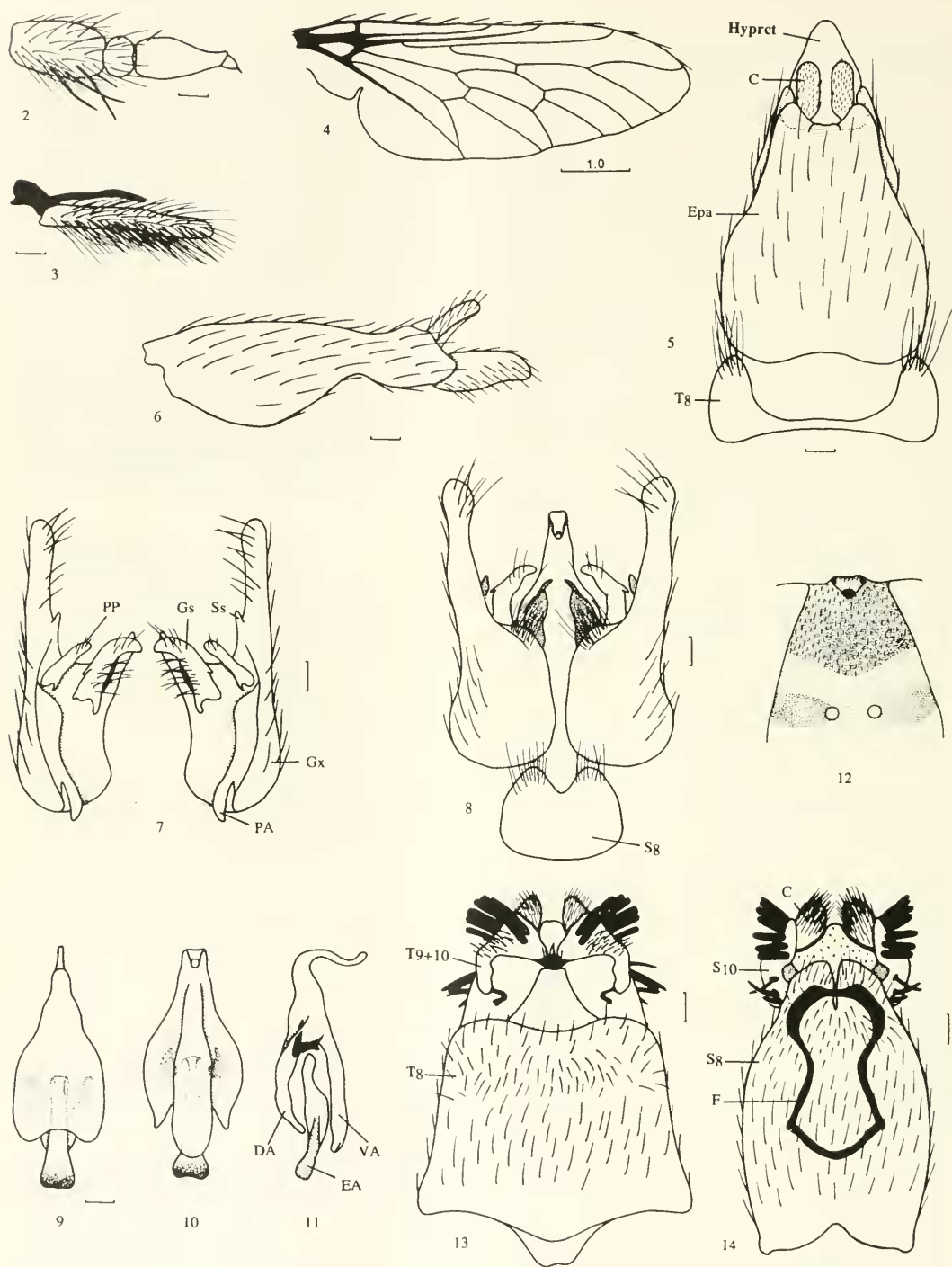
Plesiomorphic	Apomorphic
1. Scape with scattered setae.	Scape with setae abundant ventrally.
2. Flagellum with two stylomeres.	Flagellum with one stylomere.
3. Flagellum equal to or longer than scape.	Flagellum shorter than scape.
4. Scutellum with two pairs of posterior macrosetae.	Scutellum with one pair of posterior macrosetae.
5. Wing membrane concolorous.	Wing membrane patterned.
6. Posterolateral corner of epandrium without macrosetae.	Posterolateral corner of epandrium with macrosetae.
7. Gonostylus without basolateral projection.	Gonostylus with basolateral projection.

Species	Character Matrix						
	1	2	3	4	5	6	7
<i>Dialineura gorodkovi</i>	1	2	2	1	1	2	1
<i>Pallicephala flavipilosa</i>	1	1	1	1	1	2	2
<i>Pallicephala occidentalis</i>	1	1	1	1	1	2	2
<i>Pallicephala quebecensis</i>	1	1	1	1	1	2	1
<i>Pallicephala slossonae</i>	2	2	2	2	2	1	2
<i>Pallicephala variegata</i>	1	1	2	1	1	2	2
<i>Pallicephala westcotti</i>	1	2	1	1	1	2	1
<i>Pallicephala willistoni</i>	2	2	2	2	2	1	1

1 = plesiomorphic state; 2 = apomorphic state.

cell m_3 open; discal cell acute basally; cell cup closed with short petiole; m-cu/r-m subequal. **Legs:** Coxae moderately long; setae elongate, scattered on anterior and posterior surfaces; forecoxa with 2–3 black apical macrosetae; hindcoxa lacking macrosetae laterally. Hindfemur with 6–10 anteroventral macrosetae.

Abdomen: Slender to moderately broad, gradually tapering from segment 3 to apex; dorsum somewhat flattened in female, more convex in male; male dorsum covered entirely with silver grey pruinosity and white setae; female dorsum extensively, with grey pruinosity, some species having distinct, dark, glossy, anterior bands. **Male terminalia** (Figs. 5–11): Tergite 8 large, deeply con-



Figs. 2-14. *Dialineura gorodkovi* (6932, 6920) 2. Male antenna, lateral view. 3. Male maxillary palp, lateral view. 4. Male wing, dorsal view. 5. Male tergite 8, epandrium, cercus, and hypoproct, dorsal view. 6. Male epandrium, cercus, and hypoproct, lateral view. 7. Male gonocoxite and gonostylus, dorsal view. 8. Male sternite 8, gonocoxite and gonostylus, ventral view. 9. Male aedeagus, dorsal view. 10. Male aedeagus, ventral view. 11.

stricted along posterior margin. Sternite 8 somewhat reduced; posterior margin emarginate. Epandrium longer medially than wide, in most species more markedly narrowing posteriorly than in the type species and has a distinct, lateral incision; cercus free, well sclerotized, never extending beyond hypoproct; hypoproct varies greatly in size, not extending beyond cercus in the type species, but in other species extending moderately to noticeably beyond cercus, being longer than half the length of epandrium; basal membrane of hypoproct weak, generally extending to or near anterior margin of epandrium, but not attached to anterior margin of aedeagus. Hypandrium absent. Gonocoxite not united ventrally except by a weak membrane, in lateral view characteristically projecting posteriorly; parameral apodeme short and narrow, not attached to aedeagus; parameral process (Nagatomi and Lyneborg 1988) short, finger-like, apex rounded; some species show an additional small, finger-like process (substylus, Nagatomi and Lyneborg 1988) on inner margin of gonocoxite slightly distad to insertion of parameral process. Gonostylus broad, dorsoventrally flattened with lateral spine-like projections. Aedeagus with dorsal apodeme broad basally, tapering posteriorly to narrow, ventrally down-turned distiphallus with distal apex up-turned; ventral apodeme broad, oval, extended anteriorly beyond dorsal apodeme; ejaculatory apodeme simple, thickened proximally. **Female terminalia** (Figs. 13, 14): Tergite 8 (T_8) subrectangular, wider than long, posterior margin tapered posteriorly, generally retracted under tergite 8 to give appearance of a truncated posterior margin. Tergite 9+10 fused (T_{9+10}); large. Cercus (C) subtriangular,

membranous; numerous, fine, moderately long setae. Sternite 8 (S_8) large; longer than wide; posterior margin with median emargination. Sternite 9 greatly modified, invaginated above sternite 8, forming internal furca (F) that is closed anteriorly. Sternite 10 membranous; subtriangular with short, fine setae.

Immature stages.—Unknown.

Biology.—Adults inhabit sandy hummocks on the northern boreal zone, and many can be found in the northern coastal dunes of Canada.

Distribution.—In the Nearctic region, *Dialineura* ranges from northern Manitoba to the Yukon.

Dialineura gorodkovi Zaitzev

Dialineura gorodkovi Zaitzev (1971: 191); Lyneborg (1975: 577).

Derivation of name.—This species is a patronym in honor of K. B. Gorodkov.

Description of male ($N = 10$).—Length (excluding antenna) 7.7–10.0, 8.5 mm.

Head: Depth 1.4–1.7, 1.5 mm. Ocellar tubercle covered with dense brownish grey pruinosity; ocellar setae dark reddish brown, paler and more elongate along posterior margin. Eye dark red; median margin of eye angulate. Frons with dense white pile, dark grey dorsally; dark grey band of pile lateral to antennal base; setae dark yellow, moderately long with a few scattered dark reddish brown setae. Antenna (Fig. 2) dark brown, with grey pruinosity; setae pale yellow, fine, mixed with thicker dark reddish brown setae on scape; setae dark yellow on pedicel, dark reddish brown on flagellum; length of antenna 0.5 times head depth; length of scape 0.32–0.40, 0.35 mm, 1.5–

← Male aedeagus, lateral view. 12. Female head, frontal view. 13. Female terminalia, dorsal view. 14. Female terminalia, ventral view. Abbreviations: Cercus (C); Dorsal Apodeme (DA); Ejaculatory Apodeme (EA); Epandrium (Epa); Furca (F); Gonocoxite (Gx); Gonostylus (Gs); Hypoproct (Hyprct); Parameral Apodeme (PA); Parameral Process (PP); Sternite 8 (S_8); Sternite 10 (S_{10}); Substylus (Ss); Tergite 8 (T_8); Tergite 9+10 (T_{9+10}); Ventral Apodeme (VA). Scale = 0.1 mm, unless otherwise indicated.

1.9, 1.7 times width, 3.2–4.0, 3.5 times length of pedicel; length of pedicel 0.10 mm, 0.6–0.7, 0.7 times width; length of flagellum 0.32–0.40, 0.36 mm, 1.8–2.8, 2.3 times width, 0.9–1.2, 1.0 times length of scape; length of style 0.06–0.08, 0.07 mm. Parafacial with dense white pile. Genal setae white. Maxillary palp (Fig. 3) dark brown; length 0.52–0.70, 0.59 mm, 5.2–9.7, 6.7 times width; setae white.

Thorax: Macrosetae: np 3–4, sa 2, pa 1–2, 1, dc 2, sc 1–2, 2. Ground color grey, with mixture of white and black, fine, elongate setae; vittae brownish grey. Postpronotal lobe concolorous with thorax; setae white, elongate. Prosternal setae white. Pleuron ground color dark reddish brown, with dense grey pruinosity; setae white, elongate, abundant on propleuron and scattered over entire anepisternum and katapisternum. Scutellum grey; setae white. Laterotergite dark reddish brown, with dense grey pruinosity; setae white. **Wing** (Fig. 4): Length 5.3–7.8, 6.5 mm, 2.7–3.6, 3.0 times width; opaque, pale whitish brown; pterostigma indistinct. Halter dark brown, capitulum pale brown. **Legs:** Dark reddish brown; coxae with dense whitish grey pruinosity; black macrosetae at apex of coxae.

Abdomen: Ground color dark reddish brown, with dense whitish grey pruinosity; setae white, elongate. **Terminalia** (Figs. 5–11): Epandrium (Epa) not extending posteriorly to apex of cercus and hypoproct; posterior margin broadly emarginate; posterolateral corner without black macrosetae; cercus (C) oblong, rounded posteriorly; hypoproct (Hyprect) large, tapered posteriorly; in ventral view hypoproct attached to posterior margin of epandrium; in lateral view hypoproct rounded apically. Characteristics of gonocoxite and aedeagus described in description of genus. Gonostylus thick, with basolateral projection. Parameral process (Nagatomi and Lyneborg 1988) narrow, rounded apically.

Description of female (N = 10).—Similar to male with following exceptions. Length (excluding antenna) 7.3–10.2, 9.2 mm.

Head: Depth 1.3–1.6, 1.5 mm. Ocellar tubercle dark reddish brown, with dark gold pruinosity; setae dark reddish brown, scattered. Eyes dark reddish brown; median margin of eye straight. Frons (Fig. 12) dark reddish brown, dorsal half with dark gold pruinosity, ventral half with silver grey pruinosity; dark yellow and dark reddish brown setae, moderately long, scattered over entire frons. Antenna with dark reddish brown setae on pedicel, length of antenna 0.5–0.6, 0.5 times head depth; length of scape 0.24–0.38, 0.35 mm, 1.3–1.8, 1.6 times width, 3.0–3.8, 3.5 times length of pedicel; length of pedicel 0.08–0.10, 0.10 mm, 0.6–0.7, 0.6 times width; length of flagellum 0.32–0.40, 0.36 mm, 2.0–2.4, 2.1 times width, 0.9–1.4, 1.1 times length of scape; length of style 0.06–0.10, 0.08 mm. Maxillary palp pale yellowish brown; length 0.48–0.66, 0.59 mm, 4.8–8.3, 7.0 times width.

Thorax: Macrosetae: np 3–6, 3, sa 2, pa 1, dc 1–3, 2 sc 2. Dark gold and black setae on mesonotum, dark gold setae subappressed; white to pale yellow setae on scutellum. **Wing:** Length 6.2–8.0, 7.1 mm, 2.9–3.4, 3.2 times width. **Legs:** Foretibia dark yellowish brown, apical fourth dark reddish brown.

Abdomen: Dark reddish brown, with dense grey pruinosity along posterior third of each tergite. **Terminalia** (Figs. 13, 14): Characteristics described in description of genus. Furca (Fig. 14) oblong; posterior margin broadly emarginate; lateral margins constricted medially; anterior margin broadly rounded.

Seasonal activity.—In the specimens examined, adults were collected from 5 June until 27 August on sand dunes.

Distribution.—In the Nearctic region, *D. gorodkovi* is a northern species ranging from northern Manitoba to the Yukon.

Specimens examined (N = 82) (AMNH, CAS, CNC, INHS, UBC, UCB).—**Type material:** Species verification was based on a comparison with a male and female para-

type of *Dialineura gorodkovi* Zaitzev borrowed from V. F. Zaitzev.

Other material: CANADA: **Manitoba:** Churchill, 13-VII-1952, J. G. Chillcott, 1F; 12-VII-1952, J. G. Chillcott, 1M; 24-VII-1947, T. H. Freeman, 1M; 14-VII-1932, Sandsere, 1F; Fort Churchill, 5-VII-1954, H. M. Graham, 1M. **Northwest Territories:** 34 km E Tuktoyaktuk, 20–25-VI-1971, D. M. Wood, 9M 5F; 8–12-VII-1971, D. M. Wood, 1F; Eskimo Point, 2-VIII-1950, G. R. Roberts, 3F; 3-VIII-1950, G. G. DiLabio, 1F; Chesterfield, 27-VIII-1950, J. G. Chillcott, 1F; Kidluit Bay, Richards Island, 25-VII-1948, J. R. Vockeroth, 1F; Reindeer Depot, Mackenzie Delta, 11-VII-1948, J. R. Vockeroth, 1F; 15-VII-1948, J. R. Vockeroth, 1F; 6-VII-1948, J. R. Vockeroth, 1M 1F; Muskox Lake, 65°45'N, 108°10'W, 20-VII-1953, J. G. Chillcott, 1M 1F; 12-VII-1953, J. G. Chillcott, 1F; 10-VII-1953, J. G. Chillcott, 1M; 11-VII-1953, J. G. Chillcott, 1M; Holman, Victoria Island, 30-VI-1952, D. P. Gray, 1M; Aklavit, 15-VII-1931, Bryant, 1M. **Yukon:** British Mountains, Firth River, 24-VII-1956, R. E. Leech, 1M; 21-VII-1956, R. E. Leech, 1M; 25-VII-1956, R. E. Leech, 1F; Firth River, 14-VII-1956, E. F. Cashman, 1M; R. E. Leech, 2M; 24-VII-1956, R. E. Leech, 1M; Carcross, 16–18-VI-1982, G. and M. Wood, 18M 7F (2 pairs in copulo), on sand dunes; 2 km N Carcross, 650 m; 17-VII-1980, D. M. Wood and Lafontaine, 2F; Carcross, 13-VII-82, S. G. Cannings, L. Vasington, and R. A. Moore, 1M 2F; 22-VII-1981, S. G. Cannings, 1F; 20-VII-1987, S. G. Cannings, 1F; 2 km N Carcross, 5-VI-1981, C. S. Guppy, 1F; Old Crow, 29-VI-1983, S. G. Cannings, 1F; Trout Lake, 68°50'N, 138°45'W, S. G. Cannings, 1F.

Pallicephala Irwin and Lyneborg

Pallicephala Irwin and Lyneborg (1981a: 206); Irwin and Lyneborg (1981b: 519). Type species: *Psilocephala variegata* Loew (1869: 170) by original designation.

Derivation of name.—*palla*, feminine (Greek) = ball; *kephale* (Greek) = head.

Diagnosis.—The genus *Pallicephala* is allied to the genera *Nebritus* Coquillett and *Dialineura* Rondani by possessing fine setae on the posterior surface of the middlecoxae, by having the prosternum with fine setae in and around its central depression, and with the scape wider than the width of the first flagellomere. Males of *Pallicephala* are separated from these two genera in having the posterolateral corners of the epandrium strongly projecting and extending to or beyond the cercus and hypoproct; females are separated from *Dialineura* by having setae present on only the dorsal two-thirds of the frons, and from *Nebritus* by not having the head strongly protruding anteriorly and by having the parafacial pruinose or tomentose rather than glossy.

Moderate to large-sized, slender to heavily-bodied flies.

Description.—**Head:** Male eyes holoptic, facets equal; antenna (Figs. 47, 69), length 0.5–0.9 times head depth; scape cylindrical; pedicel ovate; flagellum vase-shaped, tapered apically; style terminal, one to two stylomeres in males, one stylomere in females; terminal spine minute; head slightly protruding at antennal level; frons in female broad, lateral margins convergent dorsally; males and females with a dull darkened band crossing at antennal level; facial and genal callus absent; parafacial broad; clypeus concave; maxillary palp one-segmented (Fig. 48), cylindrical, apex rounded; setae short on frons, restricted to dorsal two-thirds; elongate, abundant on gena and maxillary palp; absent on eyes, parafacial, and clypeus.

Thorax: Macrosetae: np 2–6, sa 1–3, pa 1–2, dc 1–3, sc 1–2. Vittae indistinguishable; setae variable on mesonotum; prosternal setae elongate; setae abundant on propleuron and anepisternum, scattered on katepisternum, absent on remaining pleural sclerites. **Wing** (Fig. 49): Opaque, occasionally with variable markings; veins brown; pterostigma diffuse; R_4 1.1–1.2 times R_5 ; cell r_4 large; length of cell r_4 1.8–2.7 times width at apex; cell m_3 generally open; discal

cell acute basally; cell cup closed with short petiole; m-cu/r-m subequal. **Legs:** Coxae moderately long; setae elongate, scattered on anterior and posterior surfaces; forecoxa with 2–3 apical, black macrosetae, generally slender, but thick in *willistoni*; hindcoxa with 0–2 lateral macrosetae, generally absent in males. Hindfemur with 2–11 anteroventral setae.

Abdomen: Thick; dorsum broadly rounded, with dense silver grey pruinosity; setae white, moderately long. **Male terminalia** (Figs. 15–20, 23–28, 31–36, 39–44, 50–57, 61–66, 70–76): Tergite 8 wide; deeply emarginate medially. Sternite 8 large, simple. Epandrium generally quadrate (lateral margins curved medioventrally in *P. variegata*, almost contiguous medioventrally; this condition appears to be highly variable based on an examination of male epandria in *P. fulvipilosa* and *P. occidentalis*); extending posteriorly (in pinned specimens) to apex of cercus and hypoproct; longer in midline than maximum width; posterior margin broadly emarginate; posterolateral corner with or without black macrosetae; cercus oval; hypoproct bilobed posteriorly; in ventral view hypoproct attached laterally to epandrium and gonocoxite with a membranous attachment to anterior margin of dorsal apodeme of aedeagus. Hypandrium reduced to crescent-shaped narrow remnant. Gonocoxite in ventral view not united medially; in lateral view with a parameral process (Nagatomi and Lyneborg 1988) bearing numerous black setae; and a posterolateral projection which may or may not bear black macrosetae. Gonostylus narrow, mediolateral patch of elongate setae posteriorly, a basolateral projection may or may not be present. Aedeagus with dorsal apodeme laterally attached by a strongly sclerotized bridge to basal section of paramere; distiphallus narrow, downwardly directed; ventral apodeme broad; ejaculatory apodeme short, apex rounded, not forked. **Female terminalia** (Figs. 21, 22, 29, 30, 37, 38, 45, 46, 59, 60, 67, 68, 78, 79): Tergite 8 subrectangular, wider than long, posterior margin tapered

posteriorly, generally retracted under tergite 8 to give appearance of a truncated posterior margin. Tergite 9+10 fused, bilobed; dorsomedial lobe with numerous large, black macrosetae; dorsolateral lobe with black macrosetae but not as large as macrosetae on dorsomedial lobe. Cercus subtriangular; membranous; numerous, fine, moderately long setae. Sternite 8 large; longer than wide; posterior margin with deep, narrow, median emargination. Sternite 9 greatly modified, invaginated above sternite 8 to form internal furca which is closed anteriorly. Sternite 10 membranous; subtriangular; setae generally short, fine, but thick in *P. sloossonae*.

Immature stages.—Larval specimens of *P. westcotti* have been collected in coastal dunes in Oregon.

Biology.—Little is known of the biology of this genus.

Distribution (Figs. 80–82).—The four western species range from California to southern British Columbia. The three eastern species range from New Brunswick and Prince Edward Island to northwestern Indiana and eastern Wisconsin.

KEY TO THE SPECIES OF *PALLICEPHALA*

1. Scape with fine white to pale yellow setae ventrally (Fig. 69); length of flagellum less than 0.7 times length of scape; in males, posterolateral corner of epandrium with black macrosetae (Fig. 70) 2
 - Scape without fine setae ventrally (Fig. 47); length of flagellum greater than 0.7 times length of scape; in males, posterolateral corner of epandrium without black macrosetae (Fig. 50) 3
2. Thoracic setae elongate, black or white; in males, black setae on parameral process and posterolateral projections of gonocoxite; in females, frons with dense mediolateral patch of setae *willistoni* (Cole)
 - Thoracic setae short to moderately long, dark yellow; in males, dark yellow setae of parameral process and posterolateral projections of gonocoxite; in females, frontal setae scattered *sloossonae* (Coquillett)
3. Two pairs of scutellar macrosetae 4
 - One pair of scutellar macrosetae 6
4. Coxae with apical macrosetae black *occidentalis* (Cole)
 - Fore and middle coxae with apical macrosetae

- dark yellow to pale brown; occasionally black macrosetae on hind coxae of males 5
5. Prosternal setae white *variegata* (Loew)
- Prosternal setae absent
..... *quebecensis* Webb and Irwin, new species
6. Wing with brown markings at crossveins (as in Fig. 49) *flavipilosa* (Cole)
- Wing without markings
..... *westcotti* Webb and Irwin, new species

Pallicephala flavipilosa (Cole)

Psilocephala variegata flavipilosa Cole (1923: 62); Cole (1965: 352).

Pallicephala flavipilosa (Cole); Irwin and Lyneborg (1981a: 207).

Derivation of name.—*flavus* (Latin) = yellow; *pilos* (Greek) = hair.

Diagnosis.—*Pallicephala flavipilosa* is similar to *P. occidentalis*, *P. variegata*, and *P. westcotti* in having a basolateral projection on the gonostylus and the scape lacking fine, elongate setae. It is separated from these species by the characteristics provided in the key.

Description of holotype male (5960).—Length (excluding antenna) 9.8 mm.

Head: Depth 2.0 mm. Ocellar tubercle reddish brown, with gray pruinosity; ocellar setae white to silver. Eye dark red; median margin of eye sinuate. Frons with dense silver pile. Antenna dark brown, with grey pruinosity; setae dark brown on pedicel and flagellum; macrosetae on scape dark brown; length of antenna 0.5 times head depth; length of scape 0.42 mm, 1.8 times width, 4.2 times length of pedicel; length of pedicel 0.10 mm, 0.5 times width; length of flagellum 0.38 mm, 1.9 times width, 0.9 times length of scape; length of basal stylomere 0.04 mm; length of apical stylomere 0.10 mm. Parafacial with dense silver pile. Genal setae silver. Maxillary palp dark brown, with grey pruinosity, length 0.58 mm, 4.8 times width; setae silver to pale yellow.

Thorax: Macrosetae: np 3, sa 1, pa 1, dc 2, sc 1. Ground color dark greyish brown; setae silver to pale yellow, short, appressed. Postpronotal lobe concolorous with thorax; setae silver to pale yellow. Pleuron dense grey; setae silver to pale yellow, abundant

on propleuron and anepisternum, scattered on katepisternum. Scutellum dense grey; setae pale yellow. Laterotergite dark brown, with grey pruinosity; setae pale yellow. **Wing:** Length 7.8 mm, 3.1 times width; pale yellow, with pale brown spot at fork of R_{4+5} and pale brown border on crossveins r-m, m-m, and m-cu, and veins M_{1+2} , basal half of M_3 , and apical half of CuA_1 ; pterostigma brown. Halter dark reddish brown, stalk paler. **Legs:** Coxae and femora dark reddish brown, with grey pruinosity; tibiae dark yellow, apex reddish brown; tarsomere 1 with basal half dark yellow, apical half and remaining tarsomeres reddish brown.

Abdomen: Ground color dark reddish brown, with grey pruinosity; tergite 1 with median reddish brown area; tergites 2–3 with median reddish brown triangle; tergite 4 reddish brown. **Terminalia** (Figs. 15–20): Epandrium generally quadrate (lateral margins occasionally curved medioventrally); posterolateral corners lacking black macrosetae. Black setae on parameral process and posterolateral projections of gonocoxite. Gonostylus with basolateral projection.

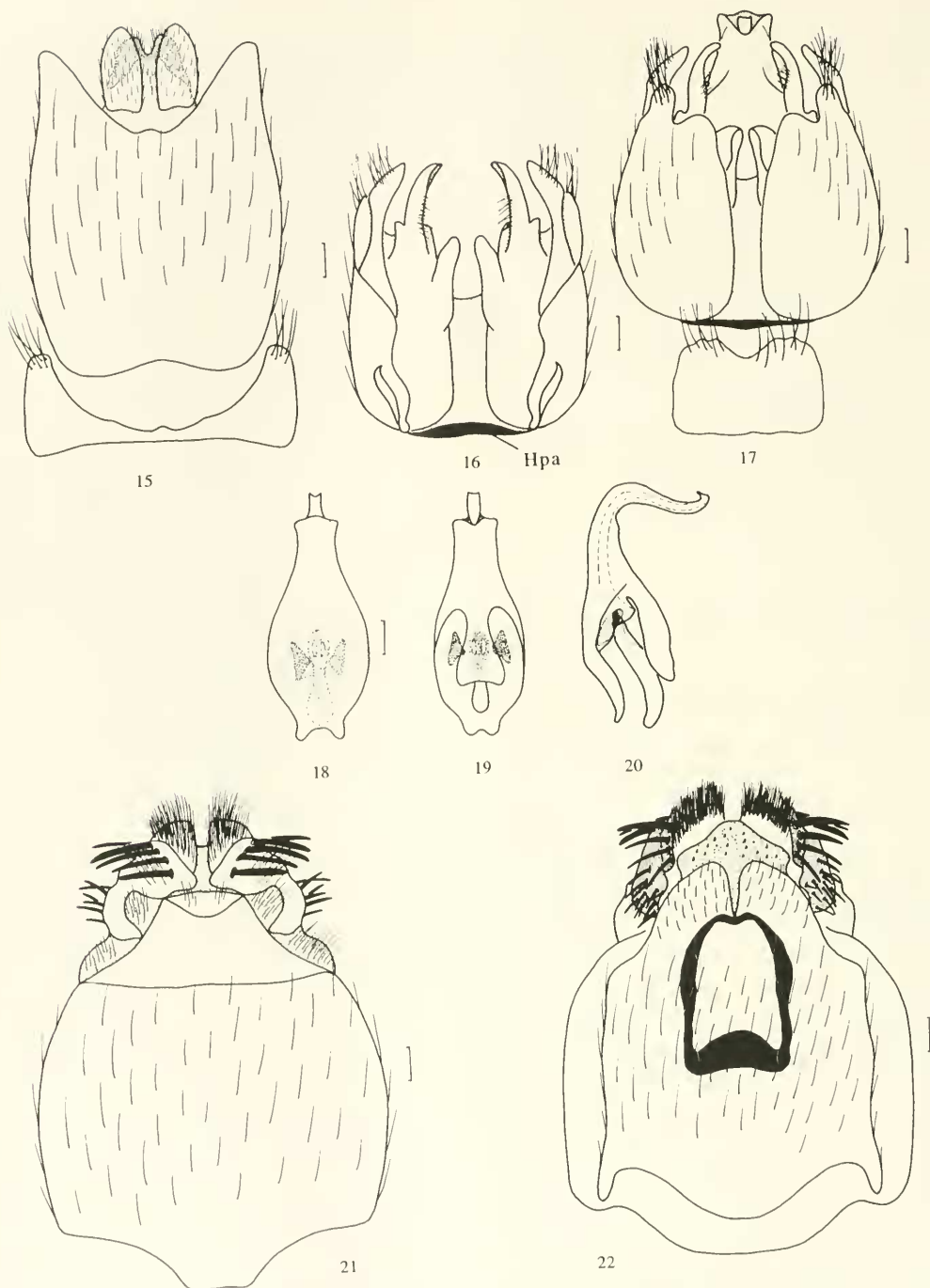
Male variation (N = 6).—Length (excluding antenna) 7.5–10.2, 9.0 mm.

Head: Depth 1.5–2.0, 1.8 mm. Length of antenna 0.5–0.6, 0.5 times head depth; length of scape 0.34–0.42, 0.38 mm, 1.5–2.1, 1.7 times width, 4.2–4.8, 4.4 times length of pedicel; length of pedicel 0.08–0.10, 0.09 mm, 0.5–0.6, 0.6 times width; length of flagellum 0.28–0.38, 0.33 mm, 1.6–1.9, 1.9 times width, 0.8–0.9, 0.9 times length of scape; length of basal stylomere 0.02–0.06, 0.04 mm, length of apical stylomere 0.06–0.12, 0.09 mm. Length of maxillary palp 0.44–0.60, 0.52 mm, 3.8–7.5, 5.4 times width.

Thorax: Macrosetae: np 3, sa 1, pa 1, dc 2–3, 2, sc 1. **Wing:** Length 5.5–7.8, 6.7 mm, 2.7–3.1, 2.9 times width.

Description of female.—Similar to male with following exceptions (N = 4). Length (excluding antenna) 12.5–14.6, 13.3 mm.

Head: Depth 1.9–2.1, 2.0 mm. Ocellar tubercle black; setae black. Eye with median



Figs. 15-22. *Pallicephala flavipilosa* (5942, 5933) 15. Male tergite 8, epandrium, cercus, and hypoproct, dorsal view. 16. Male hypandrium, gonocoxite and gonostylus, dorsal view. 17. Male sternite 8, hypandrium, gonocoxite and gonostylus, ventral view. 18. Male aedeagus, dorsal view. 19. Male aedeagus, ventral view. 20. Male aedeagus, lateral view. 21. Female terminalia, dorsal view. 22. Female terminalia, ventral view. Abbreviation: Hypandrium (Hpa). Scale = 0.1 mm, unless otherwise indicated.

margin rounded. Frons black, with dense silvery grey pile; setae black, short, appressed, scattered. Length of antenna 0.5–0.6, 0.6 times head depth; length of scape 0.50–0.52, 0.51 mm, 1.4–1.6, 1.6 times width, 4.2–5.2, 4.7 times length of pedicel; length of pedicel 0.10–0.12, 0.11 mm, 0.4–0.5, 0.5 times width; length of flagellum 0.36–0.38, 0.37 mm, 1.2–1.6, 1.5 times width, 0.7–0.8, 0.7 times length of scape; length of style 0.12–0.16, 0.14 mm. Length of maxillary palp 0.62–0.72, 0.68 mm, 3.3–4.5, 4.2 times width.

Thorax: Macrosetae: np 3, sa 1, pa 1, dc 2, sc 1. **Wing:** Length 9.3–9.9, 9.5 mm, 3.1–3.2, 3.1 times width. **Legs:** Foreleg with coxa and femur reddish brown; tibia dark yellowish brown, apex reddish brown; tarsomere 1 dark yellow brown, apex reddish brown, tarsomeres 2–5 reddish brown.

Abdomen: Dark reddish brown with dense grey pruinosity on tergites 1–3, 5–7, and laterally on tergite 4; tergite 8 glossy. **Terminalia** (Figs. 21, 22): Furca (Fig. 22) oblong; posterior margin slightly emarginate; lateral margin sinuate; anterior margin slightly emarginate.

Seasonal activity.—In the specimens examined, adults were collected from 7 April until 28 May.

Distribution (Fig. 80).—*Pallicephala flavipilosa* is a western species known only from California.

Specimens examined (N = 12) (CAS, INHS, UCB, UNeb).—**Type material:** The holotype male of *Psilocephala variegata flavipilosa* (California Academy of Sciences, type number 1486; M. E. Irwin Therevidae Number 5960) was collected at Paso Robles, California on 26 April 1919 by E. P. Van Duzee.

Other material: UNITED STATES: CALIFORNIA: **Butte County:** Lake Ahart, Chico area, 7-IV-1961, 1M; **Humboldt County:** Grizzly Creek, 25-IV-1954, B. P. Bliven, 1 F; **Monterey County:** Arroyo Seco River, 8 km SW Greenfield, 122 m, 3-V-1975, W. W. Middlekauff, 1M; **Napa**

County: Napa, 28-V-1960, R. E. Rice, 1F; **Plumas County:** Feather River at Blairsden, 16-V-1982, J. A. Powell, 3M; **San Luis Obispo County:** Paso Robles, 26-IV-1919, E. P. Van Duzee, 1M 1F; **Shasta County:** Viola, 18-V-1941, C. D. Michener, 1F; **Tehama County:** 7-IV-1961, 1M 1F, in copulo.

Pallicephala occidentalis (Cole)

Psilocephala variegata occidentalis Cole (1923: 61); Cole (1965: 352).

Pallicephala occidentalis (Cole); Irwin and Lyneborg (1981a: 208).

Psilocephala fuscipennis Cole (1923: 62); Cole (1965: 352). **NEW SYNONYMY.**

Pallicephala fuscipennis (Cole); Irwin and Lyneborg (1981a: 208).

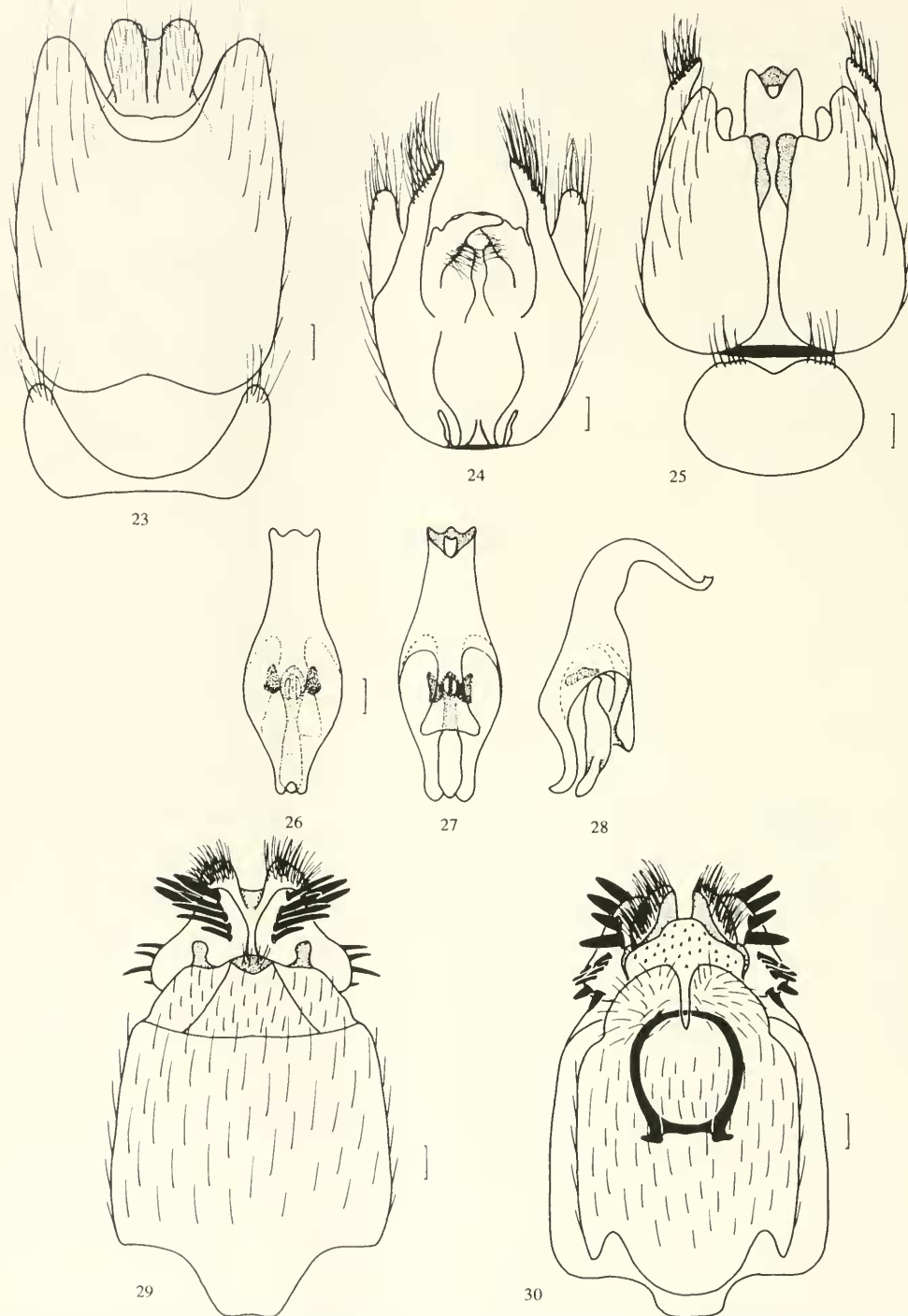
Derivation of name.—*occidentalis* (Latin) = of the west.

Cole (1923) described *Psilocephala fuscipennis* on the basis of a single female that differed from females of *Psilocephala variegata occidentalis* and *P. variegata flavipilosa* by having the thoracic setae black, short, appressed and the wings largely cloudy. A comparison of the holotype female of *P. fuscipennis* with females of *Pallicephala occidentalis* indicates that the holotype is a badly rubbed specimen of which the pale setae on the thorax have been removed leaving only the underlying black, short, appressed setae. The wing membranes of females in both of these species are distinctly clouded. Based on this comparison we are synonymizing *P. fuscipennis* with *P. occidentalis*.

Diagnosis.—*Pallicephala occidentalis* is similar to *P. flavipilosa*, *P. variegata*, and *P. westcotti* in having a basolateral projection on the gonostylus and the scape lacking fine, elongate setae. It is separated from these species by the characteristics provided in the key.

Description of holotype male (5962).—Length (excluding antenna) 10.2 mm.

Head: Depth 1.8 mm. Ocellar tubercle black, with grey pruinosity; ocellar setae



Figs. 23–30. *Pallicephala occidentalis* (5952, 5935) 23. Male tergite 8, epandrium, cercus, and hypoproct, dorsal view. 24. Male hypandrium, gonocoxite and gonostylus, dorsal view. 25. Male sternite 8, hypandrium, gonocoxite and gonostylus, ventral view. 26. Male aedeagus, dorsal view. 27. Male aedeagus, ventral view. 28. Male aedeagus, lateral view. 29. Female terminalia, dorsal view. 30. Female terminalia, ventral view. Scale = 0.1 mm, unless otherwise indicated.

black. Eye brown, median margin of eye sinuate. Frons with dense white pile. Antenna dark brown with dense grey pruinosity; setae black; macrosetae on scape black; length of antenna 0.6 times head depth; length of scape 0.44 mm, 1.7 times width, 3.7 times length of pedicel; length of pedicel 0.12 mm, 0.7 times width; length of flagellum 0.40 mm, 1.8 times width, 0.9 times length of scape; length of basal stylomere 0.04 mm; length of apical stylomere 0.10 mm. Parafacial with dense white pile. Genal setae white. Maxillary palp dark brown, length 0.60 mm, 6.0 times width, setae white to pale yellow.

Thorax: Macrosetae: np 3, sa 2, pa 1, dc 2, sc 2. Ground color dark brown with dense grey pruinosity; setae predominately black, short, appressed, mixed with scattered white to pale yellow setae. Postpronotal lobe concolorous with thorax; setae white. Pleuron dense grey; setae white to silver, abundant on propleuron and anepisternum and white, scattered on katepisternum. Scutellum with dense silver pile; setae silver to pale gold. Laterotergite dark brown with grey pruinosity; setae white. **Wing:** Length 7.8 mm, 2.8 times width; pale smoky brown with pale brown spot at fork of R_{4+5} ; pterostigma brown. Halter dark brown, stalk paler. **Legs:** Coxae and femora dark brown, with grey pruinosity. Foretibia dark brown; middle and hind tibiae dark yellowish brown, apex dark brown. Tarsomeres on foreleg dark brown; tarsomeres of middle and hind legs dark brown with basal two-thirds of tarsomere 1 dark yellowish brown.

Abdomen: Ground color dark brown with grey pruinosity, forming a lateral triangle on tergites 1–4; setae dark brown on dark brown areas, white, appressed on pruinose areas. **Terminalia** (Figs. 23–28): Epandrium generally quadrate (lateral margins occasionally curved ventrally); posterolateral corners lacking black macrosetae; black setae on parameral process and posterolateral projections on gonocoxite. Gonostylus with basolateral projection.

Male variation (N = 10).—Length (excluding antenna) 10.0–12.5, 11.3 mm.

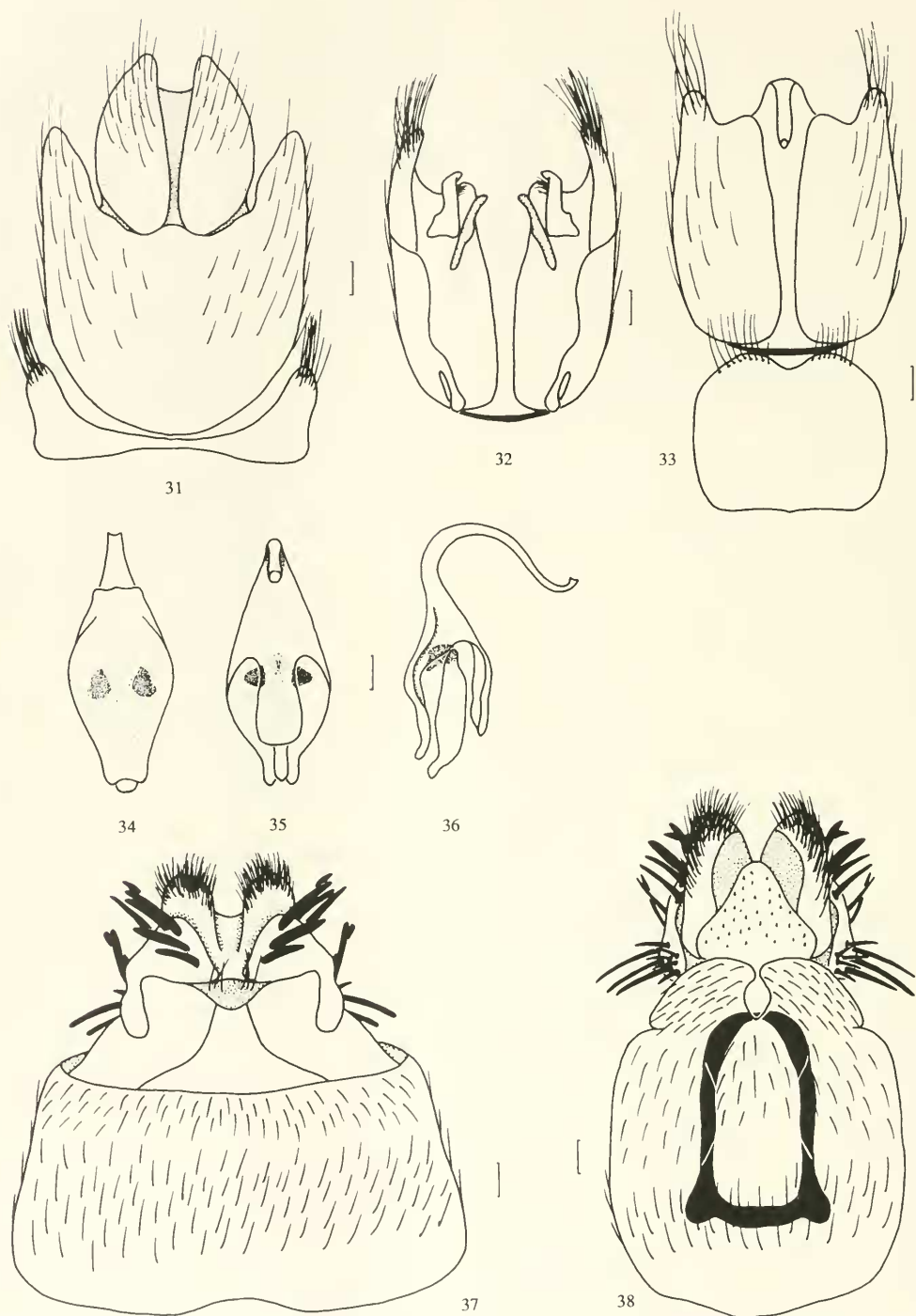
Head: Depth 1.8–2.3, 2.1 mm. Antenna with ventral macrosetae occasionally dark yellow; length of antenna 0.5–0.6, 0.6 times head depth; length of scape 0.38–0.54, 0.47 mm, 1.3–1.9, 1.7 times width, 2.7–4.5, 3.8 times length of pedicel; length of pedicel 0.10–0.14, 0.12 mm, 0.5–0.7, 0.6 times width; length of flagellum 0.38–0.44, 0.40 mm, 1.7–1.9, 1.8 times width, 0.7–1.1, 0.9 times length of scape; length of basal stylomere 0.03–0.06, 0.04 mm; length of apical stylomere 0.06–0.12, 0.10 mm. Length of maxillary palp 0.56–0.76, 0.69 mm, 3.7–8.0, 5.3 times width.

Thorax: Macrosetae: np 3, sa 1–2, 1, pa 1, dc, 2, sc 2. **Wing:** Length 7.7–9.3, 8.4 mm, 2.6–3.1, 2.9 times width; some specimens with faint, broad, pale brown band from pterostigma to anterior margin of discal cell.

Description of female (N = 9).—Similar to male with following exceptions. Length (excluding antenna) 12.0–16.2, 13.8 mm.

Head: Depth 1.8–2.2, 2.0 mm. Eyes dark brown to black. Frons with dark brown pile lateral to antennal bases; setae dark brown to black. Length of antenna 0.6–0.7, 0.6 times head depth; length of scape 0.46–0.64, 0.54 mm, 1.5–2.1, 1.9 times width, 3.3–5.3, 4.3 times length of pedicel; length of pedicel 0.10–0.16, 0.12 mm, 0.6–0.7, 0.6 times width; length of flagellum 0.36–0.48, 0.43 mm, 1.5–2.0, 1.8 times width, 0.7–1.0, 0.8 times length of scape; length of style 0.09–0.18, 0.12 mm. Maxillary palp occasionally clavate; length 0.60–0.80, 0.71 mm, 4.3–6.7, 5.0 times width.

Thorax: Macrosetae: np 2–4, 3, sa 1–2, 2, pa 1, dc 1–2, 2, sc 2 (one specimen, 5938, had a total of 5 scutellar macrosetae). Setae pale gold overlaying a layer of short black setae. **Wing:** Length 8.8–10.7, 9.6 mm, 2.9–3.3, 3.1 times width. **Legs:** Foreleg with coxa and femur reddish brown; tibia dark yellowish brown, apex reddish brown; tarsomere 1 dark yellow brown, apex reddish brown, tarsomeres 2–5 reddish brown.



Figs. 31-38. *Pallicephala quebecensis* (6739, 6753) 31. Male tergite 8, epandrium, cercus, and hypoproct, dorsal view. 32. Male hypandrium, gonocoxite and gonostylus, dorsal view. 33. Male sternite 8, hypandrium, gonocoxite and gonostylus, ventral view. 34. Male aedeagus, dorsal view. 35. Male aedeagus, ventral view. 36. Male aedeagus, lateral view. 37. Female terminalia, dorsal view. 38. Female terminalia, ventral view. Scale = 0.1 mm, unless otherwise indicated.

Abdomen: Dark brown with grey pruinosity in form of lateral triangle on tergites 1–3 and covering dorsal surface of tergites 5–7. **Terminalia** (Figs. 29, 30); furca (Fig. 30) spherical; posterior and lateral margins rounded; anterior margin truncate with lateral projection short.

Seasonal activity.—In the specimens examined, adults were collected from 8 April until 23 July.

Distribution (Fig. 80).—*Pallicephala occidentalis* is a western species ranging from northern California to southern British Columbia.

Specimens examined (N = 48) (CAS, FSCA, INHS, MEI, OregSU, RBCM, SEM, USNM, UBC, UtahSU, WashSU).—**Type material:** The holotype male of *Psilocephala variegata occidentalis* (California Academy of Sciences, type number 1484; M. E. Irwin Therevidae Number 5962) was collected at Corvallis, Oregon on 4 June 1917. The holotype female of *Psilocephala fuscipennis* (California Academy of Sciences, type number 1487; M. E. Irwin Therevidae Number 5959) was collected at Forks, Washington on 2 July 1920 by E. P. Van Duzee.

Other material: CANADA: **British Columbia:** Robson, 30-V-1960, H. R. Foxlee, 1 F; MacGillvray Creek Game Reserve near Chilliwack, 14-VII-1953, S. D. Hicks, 1F; 15-VI-1953, S. D. Hicks, 3M 3F; W. R. M. Mason, 1M 1F; Fort Fraser, Beaumont Park, 2-VI-1987, R. A. Cannings, 8M 2F. UNITED STATES: CALIFORNIA: **Sonoma County:** Healdsburg, 17-IV-1971, T. Griswold, 1F. OREGON: Kiger Island, 8-IV-1930, J. Wilcox, 1M; 4-VI-1917, 1F; **Benton County:** Corvallis, 1F; 4-VI-1917, 1M; 10-V-1929, J. Wilcox, 1M; **Clackamas County:** Mt. Hood, 3-VII-1935, R. H. Beamer, 2F; Timberline, near Government Camp, Mt. Hood, 22-VII-1937, E. C. Van Dyke, 1M; **Hood River County:** Hood River, 14-V-1917, F. R. Cole, 1M; 19-V-1917, 1M; 29 km S Hood River, 10-VI-1971, W. J. Turner, 2M 2F. WASHINGTON: **King County:** Auburn, 10-V-1932, J. Wilcox, 1M

1F; Enumclaw, 15-VI-1932, J. Wilcox, 1 F; Renton, 28-IV-1946, M. C. Lane, 1F; **Olympic County:** Forks, 23-VII-1933, C. H. Martin, 1F; **Pierce County:** Fort Lewis, 29-V-1951, R. Schuster, 1M 1F; Sumner, 17-VI-1931, J. Wilcox, 1M; Roy, 29-IV-1932, C. H. Martin, 1M 1F.

***Pallicephala quebecensis* Webb and Irwin,
NEW SPECIES**

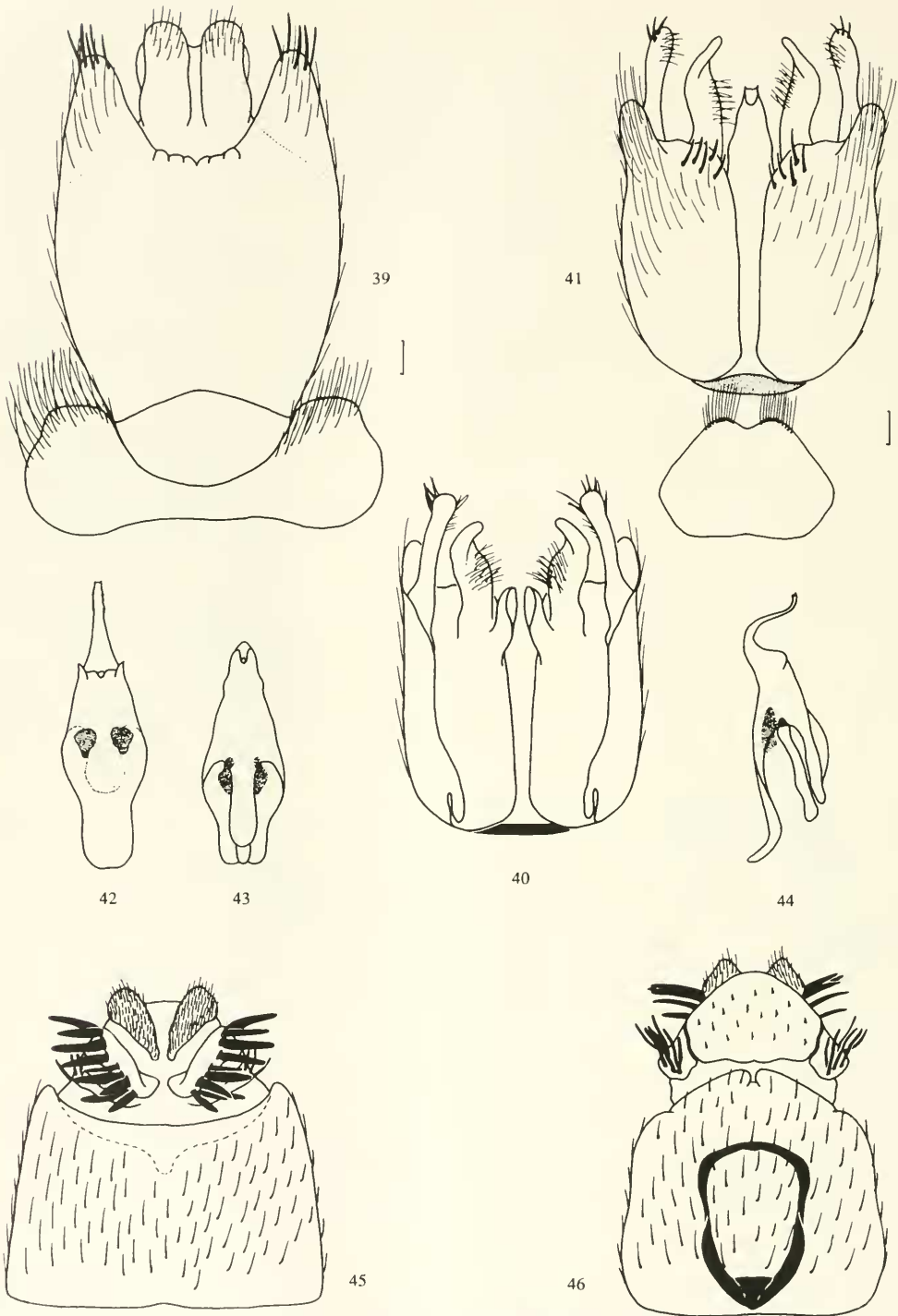
Derivation of name.—This species is named for the Province of Quebec, Canada, where all known specimens were collected.

Diagnosis.—*Pallicephala quebecensis* is similar to *P. flavipilosa*, *P. occidentalis*, and *P. variegata* in having a basolateral projection on the gonostylus and the scape lacking fine, elongate setae. It is separated from these species by the prosternum lacking setae medially.

Description of holotype male (6739).—Length (excluding antenna) 7.8 mm.

Head: Depth 1.4 mm. Ocellar tubercle dark reddish brown, with grey pruinosity; ocellar setae dark yellow. Eyes brown; median margin of eye sinuate. Frons with dense silver pile. Antenna dark brown, with grey pruinosity; setae pale to dark reddish brown on pedicel and flagellum; dark reddish brown macrosetae on scape; length of antenna 0.6 times head depth; length of scape 0.26 mm, 1.4 times width, 3.3 times length of pedicel; length of pedicel 0.08 mm, 0.6 times width; length of flagellum 0.36 mm, 2.0 times width, 1.4 times length of scape; length of basal stylomere 0.02 mm, length of apical stylomere 0.06 mm. Parafacial with dense silver pile. Genal setae white. Maxillary palp dark reddish brown; length 0.44 mm, 3.4 times width; setae white.

Thorax: Macrosetae: np 3, sa 2, pa 1, dc 1, sc 2. Ground color dark reddish brown, with dense grey pruinosity; setae silver to pale yellow on mesonotum. Postpronotal lobe concolorous with thorax; setae white. Pleuron dark reddish brown, with dense grey pruinosity; setae white, abundant on propleuron, over entire anepisternum, scat-



Figs. 39-46. *Pallicephala slossonae* (5991, 5989) 39. Male tergite 8, epandrium, cercus, and hypoproct, dorsal view. 40. Male hypandrium, gonocoxite and gonostylus, dorsal view. 41. Male sternite 8, hypandrium, gonocoxite and gonostylus, ventral view. 42. Male aedeagus, dorsal view. 43. Male aedeagus, ventral view. 44. Male aedeagus, lateral view. 45. Female terminalia, dorsal view. 46. Female terminalia, ventral view. Scale = 0.1 mm, unless otherwise indicated.

tered on anterior half of katapisternum. Scutellum dark reddish brown, with grey pruinosity; setae white to pale yellow. Laterotergite dark reddish brown, with dense grey pruinosity; setae white to pale yellow. **Wing:** Length 5.7 mm, 3.0 times width; opaque, pale white; pterostigma dark brown. Halter reddish brown, stalk paler. **Legs:** Coxae and femora dark reddish brown, with dense grey pruinosity; apical macrosetae on coxae pale brown. Tibiae and tarsi dark reddish brown.

Abdomen: Dark reddish brown, with dense grey pruinosity; anteromedian area of tergites 1–3 less pruinose; setae white to pale yellow. **Terminalia** (Figs. 31–36): Epanthrium quadrate with posterolateral corners lacking black macrosetae. Pale yellowish brown setae on parameral process of gonocoxite; pale yellowish brown to black setae on posterolateral projection. Gonostylus with basolateral projection.

Male variation (N = 5).—Length (excluding antenna) 7.5–8.0, 7.8 mm.

Head: Depth 1.4–1.6, 1.5 mm. Length of antenna 0.5–0.6, 0.5 times head depth; length of scape 0.24–0.28, 0.26 mm, 1.2–1.7, 1.4 times width, 2.8–3.3, 3.0 times length of pedicel; length of pedicel 0.08–0.10, 0.09 mm, 0.5–0.6, 0.6 times width; length of flagellum 0.34–0.38, 0.36 mm, 1.9–2.1, 2.0 times width, 1.3–1.4, 1.4 times length of scape; length of basal stylomere 0.02 mm, length of apical stylomere 0.04–0.08, 0.06 mm. Length of maxillary palp 0.44–0.50, 0.47 mm, 3.4–5.0, 4.3 times width.

Thorax: Macrosetae: np 3–4, 3, sa 2, pa 1, dc 1, sc 2. **Wing:** Length 5.7–6.3, 6.1 mm, 2.7–3.0, 2.8 times width.

Description of female (N = 10).—Similar to male with following exceptions. Length (excluding antenna) 8.4–10.9, 9.5 mm.

Head: Depth 1.3–1.6, 1.4 mm. Eyes with median margin rounded. Frons with setae yellow, moderately long. Length of antenna 0.5–0.7, 0.6 times head depth; length of scape 0.28–0.34, 0.31 mm, 1.3–1.6, 1.5 times width, 2.8–4.3, 3.6 times length of

pedicel; length of pedicel 0.08–0.10, 0.09 mm, 0.4–0.6, 0.5 times width; length of flagellum 0.32–0.40, 0.36 mm, 1.7–2.2, 1.9 times width, 1.0–1.3, 1.2 times length of scape; length of basal stylomere 0.02 mm, length of apical stylomere 0.04–0.08, 0.6 mm. Length of maxillary palp 0.40–0.56, 0.47 mm, 3.3–5.5, 4.4 times width.

Thorax: Macrosetae: np 3–4, 3, sa 2, pa 1–2, 1, dc 1–2, 1, sc 2. **Wing:** Length 6.7–8.0, 7.4 mm, 2.8–3.4, 3.1 times width.

Abdomen: Abdomen dark reddish brown, covered with dense grey pruinosity. **Terminalia** (Figs. 37, 38): Furca (Fig. 38) oblong; posterior margin rounded; lateral margins parallel; anterior margin sinuate with lateral projections rounded.

Seasonal activity.—In the specimens examined, adults were collected from 2 July until 5 August.

Distribution (Fig. 82).—*Pallicephala quebecensis* is an eastern species collected only from Great Whale River, Quebec, Canada.

Specimens examined (N = 18).—The holotype male (Canadian National Collection, type number 20890; M. E. Irwin Therevidae Number 6739) was collected at Great Whale River, Quebec, Canada, on 18-VII-1949 by J. R. Vockeroth. Paratypes (CNC, INHS). Four males, 15 female, all with locality and collector information same as holotype: 1M 1F, 2-VII-1949; 3F, 18-VII-1949; 1F, 25-VII-1949; 3M 6F, 27-VII-1949; 1F, 31-VII-1949; 1F, 5-VIII-1949.

Pallicephala slossonae (Coquillett)

Psilocephala slossonae Coquillett (1893: 227): emendation (Irwin and Lyneborg 1981a: 234).

Psilocephala slossoni Coquillett (1893: 227): incorrect original spelling (Irwin and Lyneborg 1981a: 234).

?*Brachylinga slossonae* (Coquillett); Irwin and Lyneborg (1981a: 234).

Pallicephala slossonae (Coquillett): **NEW COMBINATION.**

Derivation of name.—Species named in honor of Mrs. Slosson, who collected the original specimens.

Diagnosis.—*Pallicephala slossonae* is similar to *P. willistoni* by having fine, elongate setae ventrally on the scape and black macrosetae on the posterolateral corners of the male epandrium. It is distinguished from *P. willistoni* by having yellow setae on the mesonotum, males are smaller and thinner with dark yellow setae on the parameral process and posterolateral projections of the gonocoxite, and females with the frontal setae short and scattered.

Description of holotype female (6704).—Length (excluding antenna) 9.6 mm.

Head: Depth 1.5 mm. Ocellar tubercle dark reddish brown, with grey pruinosity; ocellar setae whitish yellow. Eyes reddish brown; median margin of eye sinuate. Frons with dense white pile; setae yellow. Antenna dark brown, with yellowish grey pruinosity; setae white, fine, numerous, ventrally on scape, dark brown on pedicel; dark brown macrosetae on scape; length of antenna 0.7 times head depth; length of scape 0.52 mm, 1.9 times width, 5.2 times length of pedicel; length of pedicel 0.10 mm, 0.5 times width; length of flagellum 0.30 mm, 1.7 times width, 0.5 times length of scape; length of style 0.12 mm. Parafacial with dense white pile. Genal setae white. Maxillary palp yellow brown, with silver pruinosity; length 0.58 mm, 6.4 times width, setae white.

Thorax: Macrosetae: np 3, sa 2, pa 1, dc 1, sc 2. Ground color grey brown; setae white to pale yellow, subappressed. Postpronotal lobe dark reddish brown, with grey pruinosity; setae pale yellow. Pleuron dark reddish brown, with dense grey pruinosity; setae white to pale yellow on propleuron, scattered on anepisternum and katepisternum. Scutellum dark brown, with grey pruinosity; setae pale yellow. Laterotergite dark brown, with grey pruinosity; setae pale yellow. **Wing:** Length 8.0 mm, 3.2 times width; opaque, dull white; pale brown markings bordering apex of cells dc and br, r-m, and fork of R_{4+5} ; pterostigma dark brown. Halter dark yellow. **Legs:** Coxae dark reddish brown, with dense white pruinosity; apical macrosetae dark brown. Femora dark yellow.

Tibiae dark yellow, apex reddish brown. Tarsomeres reddish brown.

Abdomen: Ground color dark brown, with dense whitish grey pruinosity, separated medially on tergite 1, covering posterior two-thirds and extending to anterolateral corners of tergites 2–4, entire on tergites 5–7; dorsal and lateral setae white, setae on sternite 10 short, black, thick, more distinct than in other species. **Terminalia** (Figs. 45, 46): Furca (Fig. 46) subquadrate; anterior margin broadly rounded; lateral margins sinuate; anterior margin broadly pointed anteriorly.

Female variation (N = 3).—Length (excluding antenna) 9.1–10.9, 9.9 mm.

Head: Depth 1.4–1.5, 1.5 mm. Length of antenna 0.7 times head depth; length of scape 0.48–0.52, 0.49 mm, 1.7–1.9, 1.8 times width, 4.8–5.2, 5.0 times length of pedicel; length of pedicel 0.10 mm, 0.5–0.6, 0.5 times width; length of flagellum 0.30 mm, 1.7 times width, 0.5–0.6, 0.6 times length of scape; length of style 0.08–0.12, 0.10 mm. Length of maxillary palp 0.52–0.58, 0.54 mm, 5.2–6.4, 5.6 times width.

Thorax: Macrosetae: np 3, sa 2, pa 1, dc 1, sc 2. **Wing:** Length 7.5–8.0, 7.7 mm, 2.8–3.2, 3.0 times width.

Description of males (N = 3).—Similar to female with following exceptions. Length (excluding antenna) 7.8–9.3, 8.6 mm.

Head: Depth 1.4–1.6, 1.5 mm. Ocellar tubercle black; setae dark yellow. Eyes black; median margin of eye angular. Frons with dense white to yellow pile, becoming dark reddish brown on dorsal third. Antenna dark brown; black macrosetae on scape, becoming pale yellow dorsally; black, short setae dorsally on flagellum; length of antenna 0.6 times head depth; length of scape 0.44–0.46, 0.45 mm, 1.6–1.9, 1.8 times width, 4.0–4.6, 4.3 times length of pedicel; length of pedicel 0.10–0.11, 0.10 mm, 0.6 times width; length of flagellum 0.24–0.28, 0.27 mm, 1.5–1.8, 1.6 times width, 0.5–0.6, 0.6 times length of scape; length of style 0.10 mm. Length of maxillary palp 0.48–0.56, 0.53 mm, 4.5–6.0, 5.4 times width.

Thorax: Macrosetae: np 3–4, 3; sa 2; pa 1; dc 2; sc 2. Yellow brown setae on mesonotum and postpronotal lobe. Scutellar setae dark yellow. **Wing:** Length 6.7–7.7, 7.2 mm, 2.8–3.0, 2.9 times width. Halter pale brown. **Legs:** Fore and middle femora dark reddish brown; hindfemora pale. Tarsi dark reddish brown, basal two-thirds of tarsomere 1 dark yellow.

Abdomen: Terminalia (Figs. 39–44): Black macrosetae on posterolateral corners of epandrium (Fig. 39). Pale yellow setae on parameral process (specimen 7005 from Connecticut has a few dark reddish brown setae) and posterolateral projections on gonocoxite. Gonostylus lacking basolateral projection.

Seasonal activity.—In the specimens examined, adults were collected from 17 May until 5 June.

Distribution (Fig. 82).—*Pallicephala slossonae* is an eastern species, known only from Connecticut and New Hampshire.

Specimens examined (N = 7) (CIS, INHS, MCZ, USNM).—**Type material:** The holotype female of *Psilocephala slossoni* Coquillett (Museum of Comparative Zoology, holotype number 623, type number 27050; M. E. Irwin Therevidae Number 6704) was collected by Mrs. A. T. Slosson at Franconia, New Hampshire.

Other material: UNITED STATES: CONNECTICUT: **Cromwell County:** Cromwell, 17-V-1939, M. P. Zappe, 1M. NEW HAMPSHIRE: **Grafton County:** Franconia, Mrs. A. T. Slosson, 1F (holotype); collector unknown, 1F; **Coos County:** Zealand Camp, Fabyan, White Mountains, 686 m, 5-VI-1940, J. Hanson, 3M 1F.

Pallicephala variegata (Loew)

Psilocephala variegata Loew (1869: 170): Cole (1923: 60, 1965: 352).

Pallicephala variegata (Loew); Irwin and Lyneborg (1981a: 208).

Derivation of name.—*variegatus* (Latin) = of different sorts, particularly colors.

Diagnosis.—*Pallicephala variegata* is similar to *P. flavipilosa*, *P. occidentalis*, and

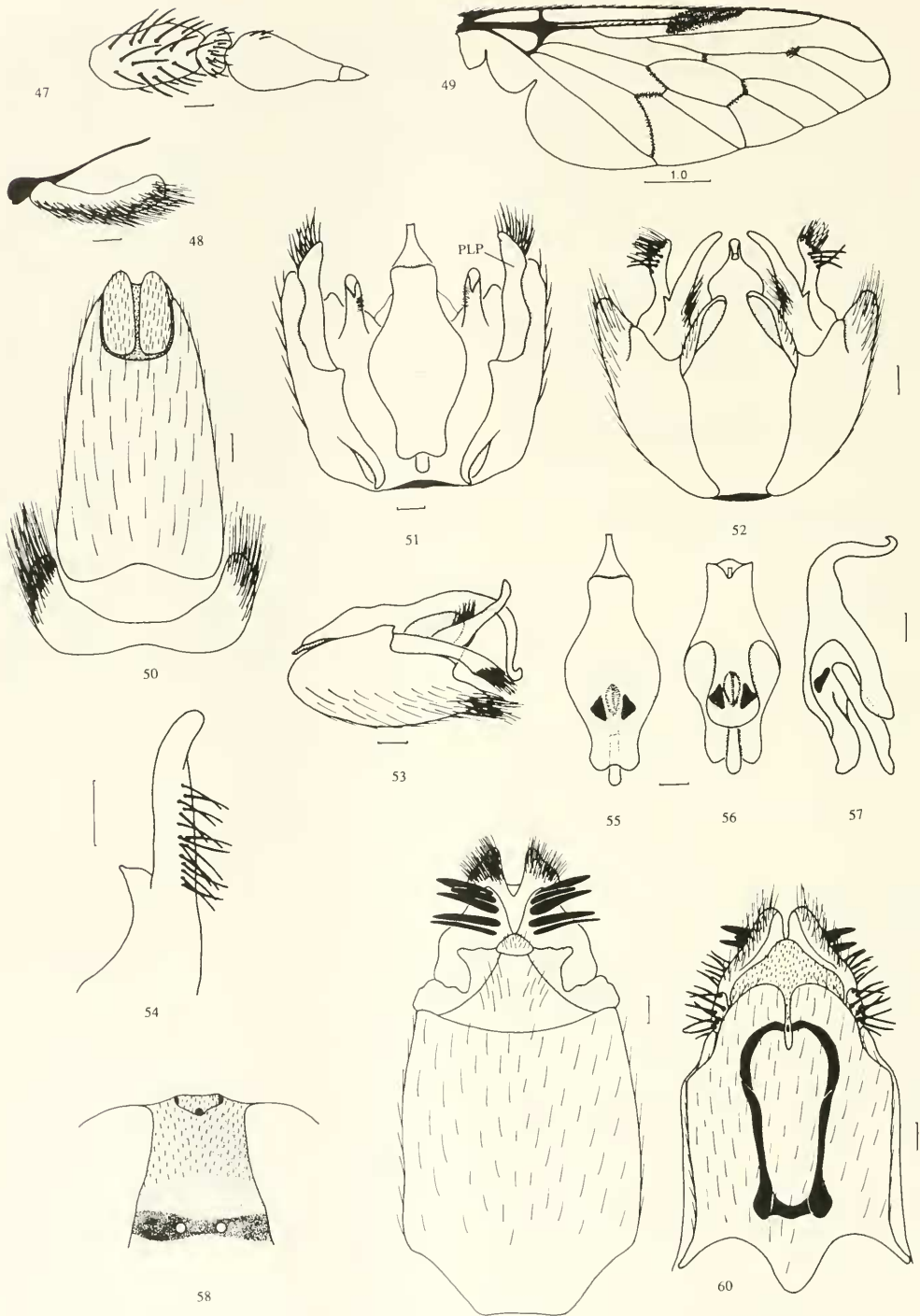
P. westcotti in having a basolateral projection on the gonostylus and the scape lacking fine, elongate setae. It is separated from these species by the characteristics provided in the key.

Description of holotype male (5967).—Length (excluding antenna) 12.4 mm.

Head: Depth 2.2 mm. Ocellar tubercle dark reddish brown, with greyish brown pruinosity; ocellar setae pale brown. Eyes reddish brown; median margin of eye angulate. Frons with dense silver pile. Antenna (Fig. 47) dark reddish brown, with grey pruinosity; setae pale yellow brown; macrosetae on scape dark brown, paler ventrally; length of antenna 0.5 times head depth; length of scape 0.44 mm, 1.7 times width, 3.7 times length of pedicel; length of pedicel 0.12 mm, 0.6 times width; length of flagellum 0.48 mm, 2.0 times width, 1.1 times length of scape; length of style 0.10 mm. Parafacial with dense white to silver pile. Genal setae white. Maxillary palp (Fig. 48) pale brown, length 0.66 mm, 5.5 times width, setae pale yellow.

Thorax: Macrosetae: np 4 (3), sa 1, pa 1, dc 1, sc 2. Ground color dark reddish brown, with grey pruinosity; setae pale yellow. Postpronotal lobe concolorous with thorax; setae pale yellow. Pleuron covered with dense silver grey pruinosity; setae white to pale yellow, abundant on propleuron and anepisternum, and white, scattered on kat-episternum. Scutellum dark reddish brown, with grey pruinosity; setae pale yellow, elongate, abundant. Laterotergite dark reddish brown, with grey pruinosity; setae pale yellow. **Wing** (Fig. 49): Length 9.1 mm, 2.8 times width; opaque white with pale brown spot at fork of R_{4+5} and pale brown bordering r-m, apex of discal cell, and base of CuA_1 ; pterostigma dark brown. Halter dark brown. **Legs:** Coxae, femora, and tarsi dark reddish brown, with grey pruinosity. Tibiae dark yellow, apex darker.

Abdomen: Dark reddish brown, with dense white pruinosity; setae white, appressed. **Terminalia** (Figs. 50–57): Epandrium conical; tapered posteriorly (lateral



Figs. 47-60. *Pallicephala variegata* (5967, 5938) 47. Male antenna, lateral view. 48. Male maxillary palp, lateral view. 49. Male wing, dorsal view. 50. Male tergite 8, epandrium, cercus, and hypoproct, dorsal view. 51. Male hypandrium, gonocoxite and gonostylus, dorsal view. 52. Male hypandrium, gonocoxite and gonostylus, ventral view. 53. Male gonocoxite, lateral view. 54. Male gonostylus, dorsal view. 55. Male aedeagus, dorsal view. 56. Male aedeagus, ventral view. 57. Male aedeagus, lateral view. 58. Male gonocoxite, dorsal view. 59. Male gonocoxite, lateral view. 60. Male hypandrium, gonocoxite and gonostylus, dorsal view.

margins curved medioventrally, almost contiguous medioventrally, this condition is highly variable based on an examination of the epandrium in several males of *P. flavipilosa* and *P. occidentalis*), posterolateral corners lacking black macrosetae. Pale yellowish brown setae on parameral process and posterolateral projections of gonocoxite. Gonostylus with basolateral projection.

Male variation (N = 10).—Length (excluding antenna) 8.1–12.4, 9.4 mm.

Head: Depth 1.5–2.2, 1.7 mm. Length of antenna 0.5–0.6, 0.5 times head depth; length of scape 0.30–0.44, 0.35 mm, 1.5–1.8, 1.7 times width, 3.0–4.0, 3.5 times length of pedicel; length of pedicel 0.08–0.12, 0.10 mm, 0.5–0.6, 0.6 times width; length of flagellum 0.32–0.48, 0.37 mm, 1.8–2.3, 2.0 times width, 0.9–1.2, 1.1 times length of scape; length of style 0.06–0.10, 0.07 mm. Length of maxillary palp 0.40–0.66, 0.49 mm, 3.7–5.6, 4.7 times width.

Thorax: Macrosetae: np 2–4, 3, sa 1–2, 2, pa 1, dc 1–2, 2, sc 2. **Wing:** Length 6.2–9.1, 6.9 mm, 2.7–3.0, 2.9 times width.

Description of female (N = 10).—Similar to male with following exceptions. Length (excluding antenna) 8.8–12.0, 10.8 mm.

Head: Depth 1.4–2.0, 1.6 mm. Ocellar tubercle with dense grey pruinosity; setae dark brown. Median margin of eye sinuate. Frons (Fig. 58) with dense silver grey pile; setae pale yellow, subappressed, with scattered, elongate, dark brown setae. Length of antenna 0.5–0.7, 0.6 times head depth; length of scape 0.32–0.54, 0.40 mm, 1.6–2.0, 1.8 times width, 3.0–5.2, 3.9 times length of pedicel; length of pedicel 0.08–0.12, 0.10 mm, 0.4–0.7, 0.6 times width; length of flagellum 0.30–0.44, 0.38 mm, 1.5–2.2, 1.7 times width, 0.8–1.1, 0.9 times length of scape; length of style 0.06–0.12, 0.09 mm. Length of maxillary palp 0.42–

0.74, 0.53 mm, 3.7–6.0, 4.8 times width, setae white.

Thorax: Macrosetae: np 2–3, 2, sa 2–3, 2, pa 1–2, 1, dc 2, sc 2. Setae on mesonotum moderately long, subappressed, more whitish silver anteriorly. Postpronotal setae white to silver. Propleural setae silver grey. **Wing:** Length 6.7–9.8, 8.0, 2.9–3.4, 3.1 times width. Cell m_3 widely opened to closed with short petiole. **Legs:** Hindtibiae pale yellow to dark yellow.

Abdomen: Dark reddish brown, posterior margins with white pruinosity. **Terminalia** (Figs. 59, 60): Furca (Fig. 60) oblong; posterior margin slightly emarginate; lateral margins sinuate; posterior margin sinuate with lateral projections short, rounded.

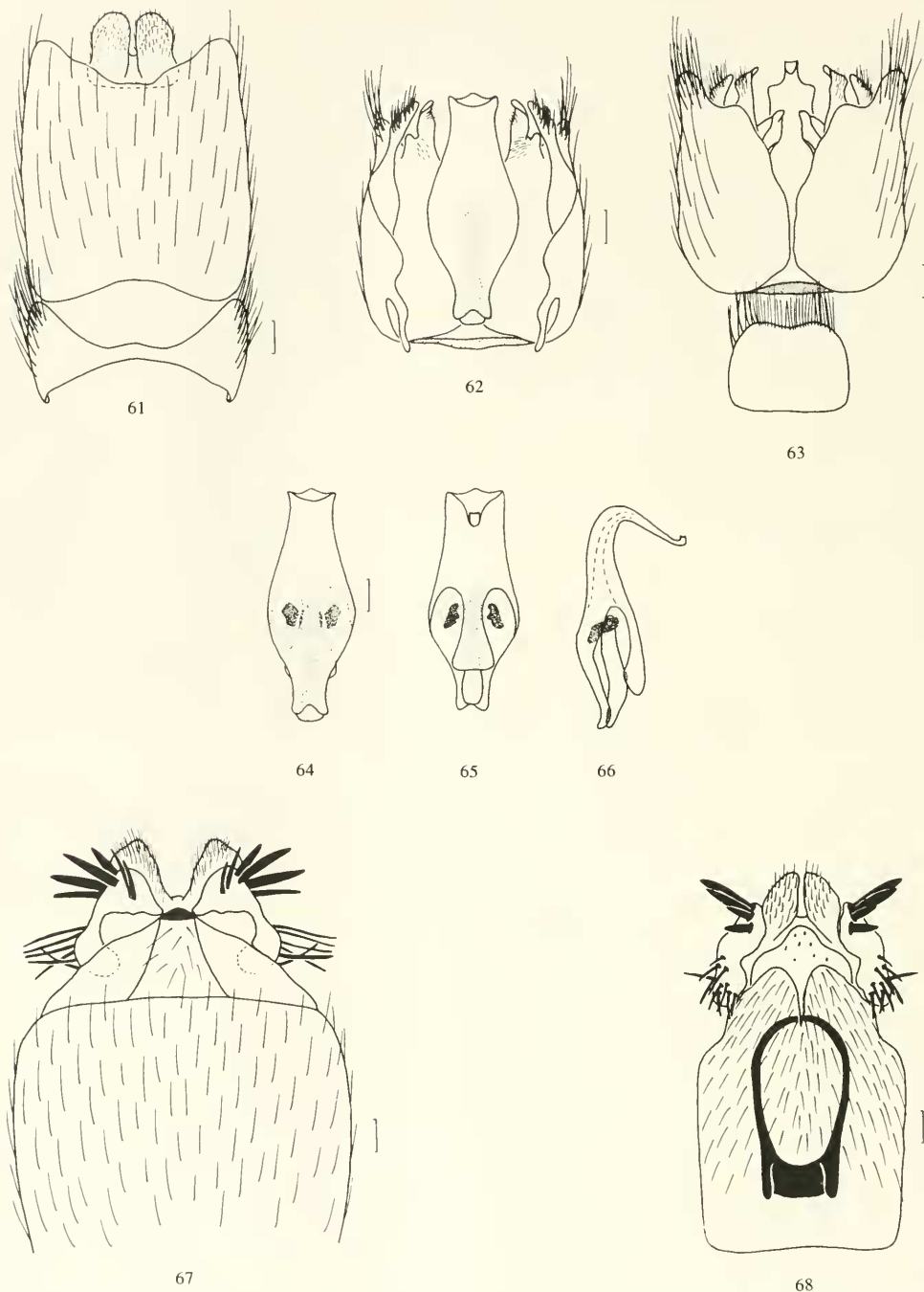
Seasonal activity.—In the specimens examined, adults were collected from 25 May until 27 July.

Distribution (Fig. 82).—*Pallicephala variegata* is an eastern species, ranging from New Brunswick and Prince Edward Island to northwestern Indiana and eastern Wisconsin.

Specimens examined (N = 57) (ANSP, CAS, CNC, FM, INHS MCZ, MSU, NYSM, ROM, SEM, USNM, UMich, UWisc, UtahSU).—**Type material:** The holotype male of *Psilocephala variegata* Loew (Museum of Comparative Zoology, type number 10668; M. E. Irwin Therevidae Number 5967) was collected in "Can." [= Canada].

Other Material: CANADA: **New Brunswick:** Bathurst, 26-VI-1941, T. N. Freeman, 1M. **Ontario:** Ridgeway, 18-VI-1911, M. C. Van Duzee, 1M 2F; 7-VII-1912, M. C. Van Duzee, 1M 2F; 7-VI-1916, M. C. Van Duzee, 1 F; Long Point, Fields, 15-V-1963, D. Barr, 1 F. **Prince Edward Island:** Green Gables, Cavendish Beach, 22-VII-1967, D. M. Wood, 1M 1F; Prackley Beach, Canadian National Park, 21-VII-1940, G. S. Walley,

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view. 56. Male aedeagus, ventral view. 57. Male aedeagus, lateral view. 58. Female head, frontal view. 59. Female terminalia, dorsal view. 60. Female terminalia, ventral view. Abbreviation: Posterolateral Projection (PLP). Scale = 0.1 mm, unless otherwise indicated.



Figs. 61-68. *Pallicephala westcottii* (5996, 5997) 61. Male tergite 8, epandrium, cercus, and hypoproct, dorsal view. 62. Male hypandrium, gonocoxite and gonostylus, dorsal view. 63. Male sternite 8, hypandrium, gonocoxite and gonostylus, ventral view. 64. Male aedeagus, dorsal view. 65. Male aedeagus, ventral view. 66. Male aedeagus, lateral view. 67. Female terminalia, dorsal view. 68. Female terminalia, ventral view. Scale = 0.1 mm, unless otherwise indicated.

1F. UNITED STATES: INDIANA: **Elkhart County**: Miller, 30-V-1934, W. J. Gerhard, 2F; **Porter County**: Indiana Dunes State Park, Tremont, 29-V-1938, I. J. Cantrell, 1M 2F. MICHIGAN: Lake Superior, 1F; **Allegan County**: Saugatuck, 18-V-1963, H. D. Niemczyk, 1F; **Benzie County**: Sleeping Bear Dunes, Platte Plains, 11-VI-1983, M. and A. O'Brien, 1F; **Berrien County**: Warren Dunes State Park near Bridgeman, 12-VI-1965, G. and K. Eickwort, 1F; T58, R20W, Sec. 29, 10-V-1968, E. J. Kochenderfer, 1M 1F; **Cheboygan County**: Douglas Lake, 23-VII-1928, 1M; 27-VI-1928, C. Martin, 1M; Duncan Bay, 27-VI-1957, R. E. Beer, 1F; 6-VII-1957, R. E. Beer, 1M 1F; 28-VI-1957, W. J. Hanson, 2F; Nigger Creek, 27-VI-1957, W. J. Hanson, 1F; **Chippewa County**: Whitefish Point, 26-VII-1914, A. W. Andrews, 1F; 27-VII-1914, A. W. Andrews, 1M; **Emmet County**: Sturgeon Bay, 9-VII-1955, W. J. Hanson, 1F; Cecil Bay, 13-VII-1955, W. J. Hanson, 1F; **Iosco County**: State Game Refuge, 26-V-1934, F. M. Gaige, 1M 2F; **Mackinaw County**: 7-VI-1960, R. & K. Dreisbach, 1F; Brevort, 22-VI-1956, H. D. Niemczyk, 1F; Epoufette, 22-VI-1956, H. D. Niemczyk, 1M 2F; **Mason County**: 25-V-1941, R. R. Dreisbach, 1M 1F; 7-VII-1951, R. R. Dreisbach, 1M 1F; **Muskegon County**: Muskegon State Park, 18-VI-1950, E. B. Hayden, 3F; **Schoolcraft County**: Manistique, 6-VI-1929, W. W. Newcomb, 1M. NEW YORK: **Jefferson County**: shore of Lake Ontario near Pulaski, 3-VI-1914, 1F; **Oswego County**: Oswego, 16-VI-1896, 1F. WISCONSIN: **Door County**: V-1954, L. R. Stelzer, 1F.

***Pallicephala westcotti* Webb and Irwin,
NEW SPECIES**

Derivation of name.—This species is named in honor of R. L. Westcott, Oregon Department of Agriculture, who collected all of the specimens.

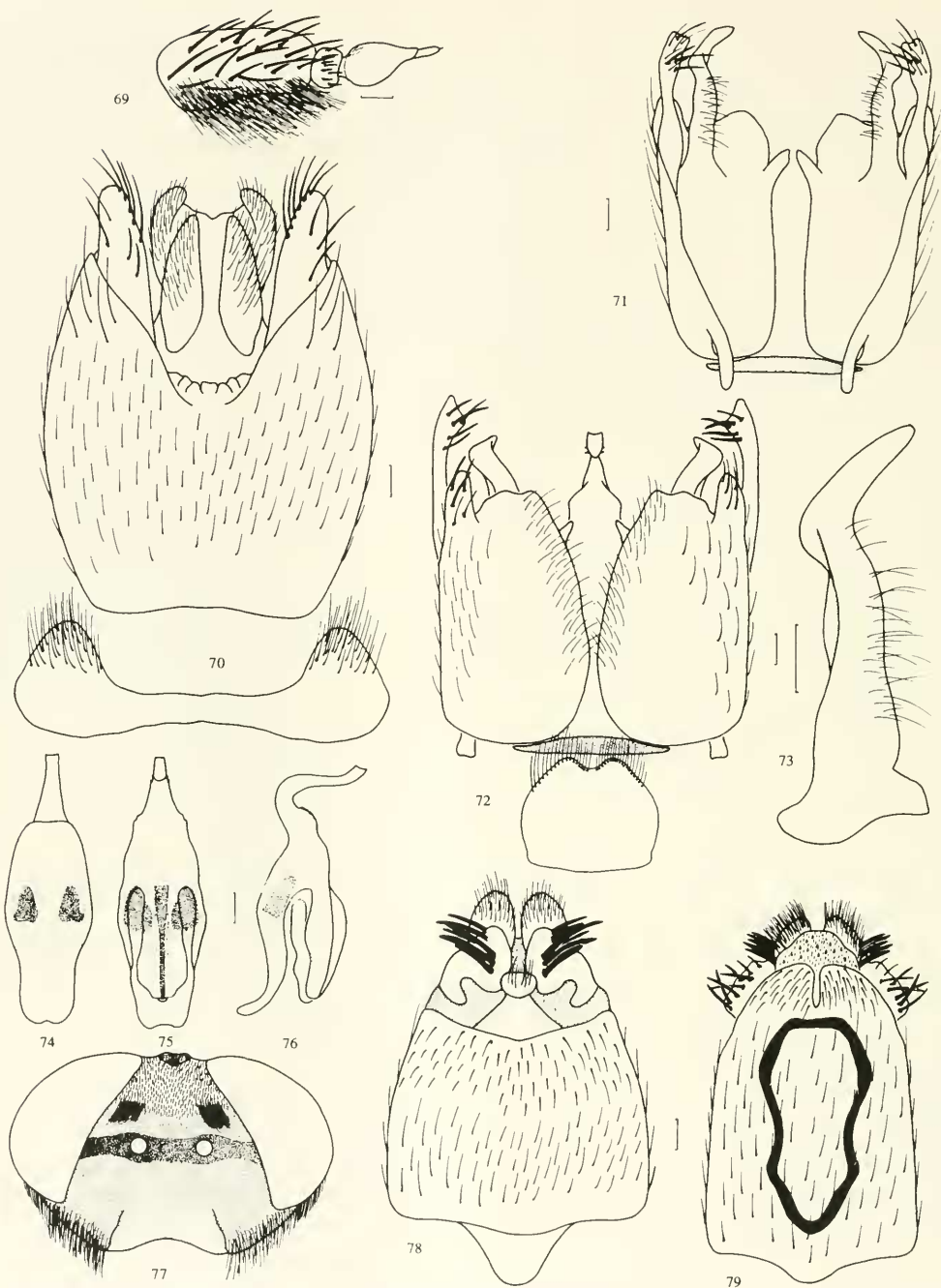
Diagnosis.—*Pallicephala westcotti* is similar to *P. flavipilosa*, *P. occidentalis*, and *P. variegata* in having a basolateral projection

on the gonostylus and the scape lacking fine, elongate setae. It is separated from these species by the characteristics provided in the key.

Description of holotype male (5995).—Length (excluding antenna) 7.1 mm.

Head: Depth 1.3 mm. Ocellar tubercle black, with grey pruinosity; ocellar setae black. Eyes black; median margin of eye sinuate. Frons with dense white pile. Antenna with scape and pedicel black, flagellum and style dark brown, with grey pruinosity; setae black; macrosetae on scape black; length of antenna 0.5 times head depth; length of scape 0.28 mm, 1.6 times width, 3.5 times length of pedicel; length of pedicel 0.08 mm, 0.6 times width; length of flagellum 0.26 mm, 1.9 times width, 0.9 times length of scape; length of basal stylomere 0.02 mm, length of apical stylomere 0.06 mm. Parafacial with dense silver pile. Genal setae silver. Maxillary palp dark brown; length 0.38 mm, 3.8 times width; setae silver to pale yellow.

Thorax: Macrosetae: np 3, sa 2, pa 1, dc 2, sc 1. Ground color black, with dark greyish brown pruinosity; setae silver to pale yellow. Postpronotal lobe concolorous with thorax; setae silver to pale yellow. Pleuron ground color black, with grey pruinosity; setae silver to pale yellow, abundant on propleuron, over entire anepisternum, scattered on katepisternum. Scutellum black, with grey pruinosity; setae pale yellow. Laterotergite dark reddish brown to black, with dense grey pruinosity; setae pale yellow. **Wing:** Length 5.2 mm, 3.1 times width; opaque, pale white; pterostigma pale brown, diffuse. Halter stalk brown, dark brown capitulum. **Legs:** Coxae dark reddish brown, with dense grey pruinosity; apical macrosetae reddish brown to black on fore and middle coxae, black on hindcoxa. Femora dark reddish brown, with grey pruinosity. Tibiae dark reddish brown, basal half of middletibia and basal two-thirds of hindtibia dark yellowish brown. Tarsi dark reddish brown.



Figs. 69–79. *Pallicephala willistoni* (5938, 5911) 69. Male antenna, lateral view. 70. Male tergite 8, epandrium, cercus, and hypoproct, dorsal view. 71. Male hypandrium, gonocoxite and gonostylus, dorsal view. 72. Male sternite 8, hypandrium, gonocoxite and gonostylus, ventral view. 73. Male gonostylus, dorsal view. 74. Male aedeagus, dorsal view. 75. Male aedeagus, ventral view. 76. Male aedeagus, lateral view. 77. Female head, frontal view. 78. Female terminalia, dorsal view. 79. Female terminalia, ventral view. Scale = 0.1 mm, unless otherwise indicated.

Abdomen: Dark reddish brown, with grey pruinosity in form of lateral triangle on tergites 1–6. **Terminalia** (Figs. 61–66): Black; setae silver. Epandrium quadrate; posterolateral corners lacking black macrosetae. Pale yellowish brown setae on parameral process of gonocoxite; pale yellowish brown and black setae on posterolateral projection. Gonostylus with basolateral projection.

Male variation (N = 2).—Length (excluding antenna) 7.1–7.3, 7.2 mm.

Head: Depth 1.3–1.5, 1.4 mm. Length of antenna 0.5 times head depth; length of scape 0.28–0.32, 0.30 mm, 1.5–1.6, 1.6 times width, 3.2–3.5, 3.4 times length of pedicel; length of pedicel 0.08–0.10, 0.09 mm, 0.6 times width; length of flagellum 0.26–0.30, 0.28 mm, 1.9 times width, 0.9 times length of scape; length of basal stylomere 0.02 mm, length of apical stylomere 0.06 mm. Length of maxillary palp 0.38–0.44, 0.41 mm, 3.8–4.4, 4.1 times width.

Thorax: Macrosetae: np 3, sa 2, pa 1, dc 1–2, sc 1. **Wing:** Length 5.2–5.7, 5.5 mm, 3.1–3.2, 3.2 times width.

Description of female (N = 1).—Similar to male with following exceptions. Length (excluding antenna) 10.2 mm.

Head: Depth 1.4 mm. Eyes with median margin rounded. Frons dark reddish brown to black with dense pale yellow pile dorsal and lateral to antennal bases; setae black and pale brown, moderately long. Length of antenna 0.6 times head depth; length of scape 0.36 mm, 1.6 times width, 3.6 times length of pedicel; length of pedicel 0.10 mm, 0.6 times width; length of flagellum 0.28 mm, 1.5 times width, 0.8 times length of scape; length of style 0.7 mm. Length of maxillary palp 0.44 mm, 3.7 times width; setae pale yellow.

Thorax: Macrosetae: np 3, sa 2, pa 1, dc 2, sc 1. Ground color dark reddish brown to black, with grey pruinosity. **Wing:** Length 6.8 mm, 3.1 times width; opaque, pale yellowish brown. **Legs:** Coxae with apical macrosetae black. Tibiae dark yellow, apex reddish brown. Tarsi dark reddish brown, basal

half of middle and hind tarsomere 1 dark yellow.

Abdomen: Dark reddish brown; setae silver to pale yellow on tergites 1–3, black, erect on tergites 4–9. **Terminalia** (Figs. 67, 68): Furca (Fig. 68) oblong; posterior margin rounded; lateral margins tapered anteriorly; anterior margin truncate with lateral projections short, rounded.

Seasonal activity.—In the specimens examined, adults were collected on 19 August.

Distribution (Fig. 80).—*Pallicephala westcotti* is a western species collected only from Waldport, Oregon.

Type material (N = 3).—The holotype male (Illinois Natural History Survey; M. E. Irwin Therevidae Number 5995) was collected on a small coastal dune away from the beach at Waldport, Oregon, on 19 August 1969 by R. L. Westcott. Paratypes (INHS, Oregon Department of Agriculture) 1M, 1F, same collection information as holotype.

Pallicephala willistoni (Cole)

Thereva crassicornis Williston (1886: 293).

Preoccupied Bellardi (1861: 88).

Dialineura willistoni Cole (1965: 352), new name for *crassicornis* Williston.

Pallicephala willistoni (Cole); Irwin and Lyneborg (1981a: 208).

Derivation of name.—Cole renamed this species in honor of S. W. Williston.

Diagnosis.—*Pallicephala willistoni* is the largest species in this genus. It is similar to *P. slossonae* by having fine, elongate setae ventrally on the scape and black macrosetae on the posterolateral corners of the male epandrium. It is distinguished from *P. slossonae* in having elongate, black and white scutal setae and black macrosetae on the parameral process and posterolateral projections on the gonocoxite, and females having a dense mediolateral patch of frontal setae.

Description of lectotype male (5958).—Length (excluding antenna) 14.2 mm.

Head: Depth 2.3 mm. Ocellar tubercle dark reddish brown, with dense grey pruinosity; ocellar setae dark brown. Eyes pale brown; quadrate; median margin of eye rounded. Frons dark reddish brown with dense silver pile around base of antennae. Antenna (Fig. 69) dark brown, with grey pruinosity; setae on scape white, fine, abundant ventrally; setae on pedicel and flagellum dark brown to black; macrosetae on scape dark brown to black; length of antenna 0.7 times head depth; length of scape 0.98 mm, 2.3 times width, 5.4 times length of pedicel; length of pedicel 0.18 mm, 0.8 times width; length of flagellum 0.38 mm, 1.5 times width, 0.4 times length of scape; length of style 0.16 mm. Parafacial with dense silver pile. Genal setae white. Maxillary palp dark brown; length 0.88 mm, 6.3 times width; setae white with scattered dark brown setae ventrally. Labellum dark reddish brown, pruinosity grey; setae pale yellow.

Thorax: Macrosetae: np 5, sa 2, pa 1, dc 2, sc 2. Ground color greyish brown; setae fine, a mixture of black and white; vittae appear as darker areas but not distinct. Postpronotal lobe concolorous with thorax; a mixture of fine black and white setae. Pleuron black, pruinosity dense silver grey; pleural setae white, abundant on propleuron, anepisternum, and katepisternum. Scutellum black, pruinosity greyish black; setae white. Laterotergite black with greyish black pruinosity; setae white. **Wing:** Length 11.0 mm, 3.0 times width. Membrane pale whitish brown, generally lacking brown markings. Pterostigma dark brown. Halter dark brown, stalk paler. **Legs:** Coxae and femora dark reddish brown, pruinosity whitish grey. Tibiae dark yellow, apex dark reddish brown. Tarsomere 1 brown, tarsomeres 2–5 dark reddish brown.

Abdomen: Black in ground color, with dense, silver grey pruinosity, concolorous; setae white. **Terminalia** (Figs. 70–76): Epanthrium with posterolateral corners bearing several black macrosetae. Setae on parameral process and posterolateral projec-

tions on gonocoxite black. Gonostylus lacking basolateral projection.

Male variation (N = 10).—Length (excluding antenna) 9.6–14.2, 11.6 mm.

Head: Depth 1.5–2.3, 1.7 mm. Length of antenna 0.7–0.8, 0.8 times head depth; length of scape 0.62–0.98, 0.71 mm, 1.9–2.3, 2.1 times width, 5.2–7.0, 5.7 times length of pedicel; length of pedicel 0.10–0.18, 0.12 mm, 0.6–0.8, 0.7 times width; length of flagellum 0.32–0.39, 0.36 mm, 1.5–2.4, 2.1 times width, 0.4–0.6, 0.5 times length of scape; length of stylomere 0.09–0.16, 0.12 mm. Length of maxillary palp 0.64–0.88, 0.75 mm, 4.6–7.8, 6.0 times width.

Thorax: Macrosetae: np 4–5, 4, sa 2, pa 1, dc 1–2, 2, sc 2. **Wing:** Length 8.4–11.0, 9.4 mm, 2.7–3.3, 3.0 times width.

Description of female (N = 10).—Similar to male with following exceptions. Length (excluding antenna) 10.9–13.6, 11.8 mm. Head depth 1.4–1.8, 1.6 mm. Median margin of eye sinuate. Frons (Fig. 77) dark reddish brown, with dense, silver pruinosity; setae dark reddish brown, distinctly more abundant ventrolaterally. Length of antenna 0.7–0.9, 0.8 times head depth; length of scape 0.60–0.74, 0.67 mm, 1.8–2.7, 2.1 times width, 5.3–7.4, 6.3 times length of pedicel; length of pedicel 0.10–0.12, 0.11 mm, 0.6–0.8, 0.6 times width, length of flagellum 0.22–0.40, 0.35 mm, 1.1–2.2, 1.8 times width, 0.3–0.6, 0.5 times length of scape; length of stylomere 0.08–0.12, 0.11 mm. Length of maxillary palp 0.50–0.96, 0.76 mm, 4.0–6.9, 5.4 times width.

Thorax: Macrosetae: np 3–6, 4–5, sa 2–3, 2, pa 1, dc 1–3, 2, sc 2. **Wing:** Length 8.2–11.4, 10.1 mm, 2.8–3.2, 3.0 times width; wing markings as in *P. variegata*, more discernable than in male.

Abdomen: Terminalia (Figs. 78, 79): Furca (Fig. 79) oblong; posterior margin truncate; lateral margin constricted medially; anterior margin broadly pointed anteriorly.

Seasonal activity.—In the specimens examined, adults were collected from 2 March

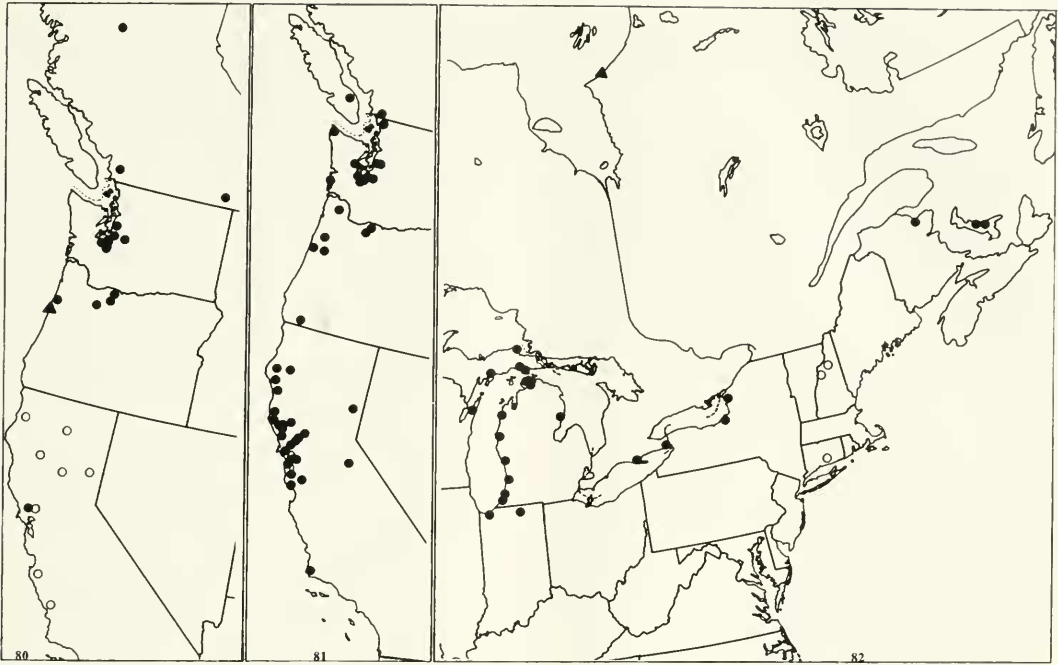


Fig. 80. Distribution of *Pallicephala occidentalis* (solid circles), *P. flavipilosa* (open circles), and *P. westcottii* (solid triangle).

Fig. 81. Distribution of *Pallicephala willistoni* (solid circles).

Fig. 82. Distribution of *Pallicephala variegata* (solid circles), *P. slossonae* (open circles), and *P. quebecensis* (solid triangle).

until 17 August, with the majority of specimens taken in April, May, and June.

Distribution (Fig. 81).—*Pallicephala willistoni* is a western species ranging from California to southern British Columbia.

Specimens examined (N = 171) (ANSP, CAS, CIS, CNC, ColoSU, CU, FSCA, INHS, MEI, MCZ, OregDA, PU, RBCM, USNM, UCB, UIda, WashSU).—**Type material:** A single syntype of *Thereva crassicornis* Williston is in the Snow Entomological Museum, University of Kansas (M. E. Irwin *Therevidae* Number 5958). This male, herein designated the lectotype, was collected in California by Baron Osten Sacken. The syntype female could not be located.

Other material: CANADA: **British Columbia:** Duncan 8-VI-1923, W. B. Anderson, 1M 2F; Agassiz, 12-V-1920, 2M. UNITED STATES: CALIFORNIA: Lectotype collected by Baron Osten Sacken, 1M; **Alameda County:** Valle Vista, Oakland, 21-

IV-1918, 1M 1F; **Humboldt County:** 3.2 km W Briceland, 21-V-1976, R. Dietz & J. Hafernik, 1M; Van Duzen River, 21-IV-1936, B. P. Bliven, 3M 1F; 18-IV-1937, B. P. Bliven, 6M 3F; **Lake County:** North fork of Cache Creek and Highway 20, 17-V-1981, T. Bolton, 1M; Middletown, 19-IV-1959, E. I. Schlinger, 1M, 19-IV-1954, E. I. Schlinger, 1F; V-1908, J. P. Baumberger, 1F; **Marin County:** Taylor State Park, 20-IV-1947, E. L. Kessel, 4M 4F; Lagunitas Creek, 15-IV-, O. Sacken, 2F; **Mendocino County:** 12.9 km W Navarro, 31-V-1967, W. W. Middlekauf & D. C. Rentz, 1M; 3.2 km S Hopland, 152 m, 31-III-1963, C. W. O'Brien, 1M; NCCRP, 4 km N Branscomb, 426 m, 12-14-V-1978, R. J. Dare, 1M; **Napa County:** Davis, 20-IV-1951, H. F. Robinson, 1M; Monticello, 16-IV-1952, E. I. Schlinger, 3M; R. M. Bohart, 1M; **Plumas County:** Feather River at Blairsden, 21-V-1982, J. A. De Benedictis, 1M; J. Powell,

1M; **San Luis Obispo County**: Pismo 20-IV-1919, E. P. Van Duzee, 1M; **Santa Clara**: Boulder Creek, 22-III-, 1M; Stanford University, 27-IV-1929, F. R. Cole, 1M; 10-V-1920, F. R. Cole, 1M; 5-V-1920, 1M; 12-V-1921, 1F; 30-IV-1920, F. R. Cole, 1M 1F; **Santa Cruz County**: Felton, 23-IV-1949, W. E. Hazeltine, 1M; **Sonoma County**: Sonoma, 29-IV-1950, H. B. Leech, 1M; 2-IV-1961, D. Q. Cavagnaro, 2M; 3.2 km N Cloverdale, 2-III-1963, C. W. O'Brien, 1M; Mesa Grande (see Villa Grande), V-1908, J. P. Baumberger, 1M; Hacienda (see Forrestville), 20-V-1961, C. Slobodchikoff, 1M; 9 km SE Gualala intersection, Wheatfield, South Fork Gualala River, 9-IV-1967, L. D. Anderson, 1M 1F; **Trinity County**: Hayfork, 701 m, 22-V-1973, J. A. Chemsak, 1M; Hayfork ranger station, 23-V-1973, J. Powell, 1M 2F; Morgan Gulch, 1.6 km E Hayfork, 22-V-1973, J. Powell, 6M; 6.4 km S Hayfork, 19-V-1973, M. Bentzien, 1M 1F; **Tuolumne County**: Pinecrest, 17-VIII-1948, P. H. Arnaud, 1F; **Yolo County**: Putah Canyon, 2-IV-1954, R. C. Bechtel, 1F. **OREGON**: **Benton County**: Corvallis, 21-VI-1936, R. E. Rieder, 1M; 27-V-1930, R. E. Dimick, 1M; 19-IV-1930, J. Wilcox, 1F; 4.8 km SW Corvallis, vicinity of Mary's River, 1-V-1956, F. F. Hasbrouck, 1M; **Columbia County**: Vernonia, 9-V-1936, K. Gray and J. Schuh, 8M; **Hood River County**: Parkdale, 1-VII-1938, K. Grey & J. Schuh, 1M; Hood River, 19-V-1917, F. R. Cole, 1M; 2-VI-1917, F. R. Cole, 2M; 24-VI-1917, F. R. Cole, 1M 1F; 22-VI-1917, F. R. Cole, 1M; 2-VI-1917, F. R. Cole, 2F; 5-VI-1917, F. R. Cole, 2F; 10-V-1917, F. R. Cole, 1F; 6-VI-1917, F. R. Cole, 1F; 15-V-1917, F. R. Cole, 1M; H. K. Morrison, 1F; Mt. Hood, H. K. Morrison, 1F; 2-VI-1917, F. R. Cole, 1M; **Josephine County**: Lake Selmac, 2-V-1969, R. L. Westcott, 1M; **Lincoln County**: Tidewater, 21-VI-1939, T. Aitken, 1M; Drift Creek, 25-IV-1926, J. E. Davis, 3M; **Polk County**: Canby, 2-V-1968, K. Goeden, 1F, on pine. **WASHINGTON**: West Washington Territory, H. K. Morrison, 1M; 5-V-

1M; no locality, no date, Kincaid, 3M; **Clallam County**: Forks, 2-VII-1920, E. P. Van Duzee, 12M 2F; **King County**: Enumclaw, 14-VI-1932, W. W. Baker, 1F; 16-VI-1933, W. W. Baker, 1M 1F; 15-VI-1932, J. Wilcox, 1M; North Bend, 13-V-1936, 1F; Seattle, 25-IV-1915, 1M; **Jefferson County**: Dosewal River, 5-IV-1962, 2M; **Mason County**: Skokomish River, 3-V-1892, 2M; **Pacific County**: Nahcotta, 20-VI-1955, 1M; 4-V-1953, T. Kincaid, 1M; 2-V-1953, T. Kincaid, 1M, 6-V-1953, T. Kincaid, 1M 2F; **Pierce County**: Sumner, 5-V-1929, F. J. Spruijt, 2M; 3-VI-1933, C. H. Martin, 2F; Puyallup, IV-1948, J. Schuh, 1M, on raspberry; Fort Lewis, 29-V-1951, R. Schuster, 1M; Orting, 14-VI-1948, G. S. Batchelor, 1M; **Skagit County**: Mt. Vernon, 3-VII-1924, A. L. Melander, 1F; **Whatcom County**: Nooksack River at Demming, 14-V-1968, D. Digeress, 1M.

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